UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION

IN RE: FLINT WATER CASES	Civil Action No.: 5:16-cv-10444-JEL-MKM (consolidated)
Elnora Carthan et al. v. Governor Rick Snyder et al.	Hon. Judith E. Levy Mag. Mona K. Majzoub

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VIDEOTAPED DEPOSITION OF MIRA KRISHNAN, Ph.D.

TUESDAY, OCTOBER 6, 2020

Volume 2

Remote oral deposition of MIRA KRISHNAN, Ph.D., conducted at the location of the witness in Grand Rapids, Michigan, commencing at approximately 9:03 a.m., on the above date, before JULIANA F. ZAJICEK, a Registered Professional Reporter, Certified Shorthand Reporter, Certified Realtime Reporter and Notary Public.

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I N D E X

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E X H I B I T S

E X H I B I T S (Continued)

MIRA KRISHNAN EXHIBIT		MARKED FOR ID
No. 19	Forensic Neuropsychological Evaluation - D[redacted] W[redacted]	371
No. 20	Wade Medical Laboratory re: D[redacted] [redacted] W[redacted], [redacted]09; Restricted Distribution-Confidential-DW[redacted]-WardeMedLab-MD-540097-000003	376
No. 21	Research Review Article: "Recent Developments in Low-Level Lead Exposure and Intellectual Impairment in Children," by Koller etc.	405
No. 22	Science Direct Water Research article: "Lead release to potable water during the Flint, Michigan water crisis as revealed by routine biosolids monitoring data," by Roy etc.	415
No. 23	Notice of Taking Audio-Visual Deposition	420

THE VIDEOGRAPHER: We are now on the record. My name is David Lane, the videographer for Golkow Litigation Services.

Today's date is October 6th, 2020. The time is 9:03 a.m.

This deposition is taking place remotely in the matter of Flint Water Cases, restricted distribution, bellwether dis -- depositions.

Our deponent today is Dr. Mira Krishnan, Ph.D.

Our court reporter today is Juliana Zajicek. Counsel will be noted on the stenographic record.

Dr. Krishnan, I just want to remind you you are still under oath from yesterday.

THE WITNESS: Thank you.

THE VIDEOGRAPHER: Please begin.

MR. ROGERS: Thanks, Dave.

MIRA KRISHNAN, Ph.D.,

called as a witness herein, having been previously duly sworn and having testified, was examined and testified further as follows:

EXAMINATION (Resumed)

BY MR. ROGERS:

Q. Good morning, Doctor.

A. Good morning.

Q. As I mentioned off the record before we got started, Mr. Lanciotti sent me an e-mail this morning which contains reference -- reference norms for the TMT and GPT tests that you administered to these bellwether plaintiffs, and I wanted to just get that on the record to make sure it's accurate and that we have it.

So remember -- you remember that discussion, of course, yesterday, right?

A. I do.

Q. So, the reference that I was provided is to a textbook by a Baron, I.S. from 2018 entitled "Neuropsychological Evaluation of the Child: Domains, Methods and Case Studies," Second Edition, Oxford University Press, is that correct?

A. That's correct.

Q. And that's the reference book that you referred to that has the normative values for the tests that we discussed, right?

A. Yeah, the -- the first and second editions of that book have the same references, but the table numbers are -- that were provided are for the second

edition.

Q. Okay. Thanks.

And what -- did you use the table numbers in your test normative scoring from the second edition?

A. That's correct. They are the same, it's the same data.

Q. Okay. And the further information is that for the TMT norms, they are at Table 10.08, Green -- I'm sorry, the names in parentheses -- "(Spreen and Gaddes)", G-a-d-d-e-s. The Kindle location that you have is near 18903 and you -- and the page reference in a, I guess, would be the hard cover book would be 524.

Is that all right?

A. To the best of my knowledge. Unfortunately the way that the Kindle book works, I'm not 100 percent sure the page number is correct, but the table number should be the same irrespective of version.

Q. Okay. And for the GPT test norms, that is Table 12.16, the author appears to be a Mr. Knight or Ms. Knights, K-n-i-g-h-t-s, and the Kindle location you referenced is 25675, the page number may be 710 in

the physical edition, right?

A. To the best of my knowledge, that's correct.

Q. Okay. And then there is a reference to the CW -- oh, sorry -- COWAT test, and a reference to a Table 9.21 in that same book. I don't recall our discussion yesterday of the COWA test. It says here on it e-mail that you mentioned it yesterday that you used it in similar evaluations but you don't believe you administered this particular test to any of the four bellwethers.

Tell me about that, what -- what's the story with that?

A. It's a test that I -- I am -- it is a test that I commonly use in this population. I -- I would have to go back and look at all of the reports, but I think it's possible that I used it in one of the 14 children that I evaluated, but I went -- I went back and looked at these four reports. I didn't use them in these four. I provided it as a courtesy. It is the other norm that I might have used in one of these evaluations that's in that book.

Q. Okay. Thank you very much.

So having said that now and provided --

provided me with this information, you believe -- you have provided either in the test data reports themselves and/or with this information, the normative data for the other two tests as to which the test kits don't have the normative data, all of the information that would be related to the scoring and the norms for all of the tests and evaluations that you did, is that right?

A. I believe that's correct.

Q. Okay. So let's turn now to some other areas. I have sort of some general questions before we get into some of the specifics that I think would bear upon all of the plaintiffs, and it has to do with your diagnoses and -- and your opinion about -- opinions about causation.

So, as I understand it, and correct me if I'm wrong, for all of these plaintiffs you hold the opinion and you've testified to the opinion and you've included it in your report that each of the plaintiffs -- as to each of the plaintiffs, that their impairments or the deficits that -- that you found in your testing were more likely than not the developmental lead exposure and that the source of the exposure was lead in the water.

Is that a fair and accurate statement of what your opinions are?

A. I stand by the opinions as they are originally written in the reports, but I believe that that's a fair summary.

Q. Well, the reason I said it this way is that, you know, over the course of the day yesterday we delved into, you know, the language that you used in the reports and I'm sort of synthesizing it down to an opinion.

So I'm going to say it again and then ask you some questions about it. And just tell me if this is -- you know, these are your opinions or not.

So you hold the opinion -- opinions that for each of the plaintiffs the impairments or deficits that you found in your testing and evaluation of them were more likely than not the result of developmental lead exposure, is that right?

MS. CARO: Objection; the reports speak for themselves.

You can answer.

BY THE WITNESS:

A. Are you -- first, can you clarify, please, if you are referring to the four bellwethers that we

are currently discussing or some other group of bellwethers?

Q. Only these four.

A. Okay. I -- again, I stand by the reports, but I believe that in these four cases I did state that I believe -- I -- I believe that that is correct.

Q. And do you also hold the opinion with respect to these four plaintiffs that the source of the exposure to lead developmentally was lead in the water?

MS. CARO: Same objection.

BY THE WITNESS:

A. The -- I discussed this in detail with each of the reports. I am not aware of any other sources of lead exposure for these children.

Q. So, therefore, as I said, you hold the opinion that the source of lead exposure for these four bellwether plaintiffs was water, right?

A. Correct.

Q. So, I'm going to ask you some follow-up questions based on that opinion:

What evidence do you have that there were elevated levels of lead in the water that each of these plaintiffs consumed? And, again, it is the four

bellwethers that we are talking about here.

MS. CARO: Objection; asked and answered.

BY THE WITNESS:

A. We discussed this in great detail yesterday. I have stated repeatedly to you that the re -- the evidence that I reviewed is the evidence that is presented in each of the reports. I have -- I have summarized everything that I reviewed. I did not review anything that is not reported in any of the reports.

BY MR. ROGERS:

Q. No, but what specifically, what specific evidence do you have that the water that these individual plaintiffs drank had elevated lead levels in the water that they consumed?

MS. CARO: Objection; asked and answered.

BY THE WITNESS:

A. I am not an expert in water delivery. I -- I know that there are many experts -- I believe that there are many experts involved in this case that would know that area better than I do.

My basis is that these children have evidence of lead exposure and they are within the known distribution of lead exposure based on water in

the Flint, Michigan water system. I -- all other evidence is the evidence that I reviewed in the reports.

BY MR. ROGERS:

Q. Okay. When you referred yesterday to that same evidence, I think you were referring to, and correct me if I'm wrong, as to the -- them being in the areas where there was reported lead in the water, you referred -- or your basis for saying that or the evidence that you had of that was the Dr. Hanna-Attisha report from 2016.

Am -- am I right about that?

A. That's correct.

Q. Okay. So just -- I don't think we marked that yesterday. I'd like to mark this as our next exhibit.

MR. ROGERS: As I said off the record before we got started with Juliana, I -- we -- I marked your APPI TPPI report as Exhibit 11 and then again as 14. So this morning we are going to start with 15, just to make sure we have a clear record on it.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 15, for

identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. So I'm going to -- I do have the screen shared, is that right, can you see this coming up now?

A. I can see it, yes.

Q. Okay. So this is the Dr. Hanna-Attisha and other authors study that we just referred to that is now Exhibit 15.

This is the evidence that you have for there having been elevated lead levels in the water that the plaintiffs consumed, is that right?

A. In the case of these four children, to the best of my memory, I did not review any direct evidence of water samples from their homes, and so this is the only basis that I would have.

BY MR. ROGERS:

Q. Thank you. I'll close that out. I'm going to stop sharing at this time.

What evidence do you have that the amount of lead in the water that was consumed by these plaintiffs was to -- was sufficient in terms of amount and duration of its consumption to cause the types of disabilities and impairments or deficits that you have diagnosed them as having?

MS. CARO: Objection; beyond the scope of the expertise.

BY THE WITNESS:

A. I am not an expert in water, and my expertise, I -- I think I have been quite clear, is in clinical neuropsychology. I am using the lab data available in each -- in the case of each children -- child, consisting of blood and bone lead levels.

BY MR. ROGERS:

Q. Okay. Ms. Caro, or Louise, I think when we discussed this subject yesterday, I asked you questions about the blood lead levels at least for the first two plaintiffs, that being S[redacted] and T[redacted] as having been negative, and I -- I think Louise's objection was something to the effect of, Well, that there isn't other evidence of blood lead levels for these children, so I wanted to follow up on that with you.

Are you aware of any evidence that these four bellwethers lead -- besides the blood lead level reports -- strike that. I'll start again. Sorry.

Are you aware of any other evidence besides the blood lead level test reports with respect to what were the actual or calculated or estimated

blood lead levels for these children?

A. I am not aware of any evidence that is not reviewed in my reports.

Q. And the evidence reviewed in your reports are the actual blood lead level test reports that were conducted on these children, correct, and nothing else?

MS. CARO: Objection; mischaracterization of testimony.

BY THE WITNESS:

A. They are the ones that -- they are the ones that I received for review.

BY MR. ROGERS:

Q. Right. So, therefore, the only evidence that you are aware of that you are -- have knowledge of as you sit here today as to what the blood lead levels were in these four children are contained in the test reports that you received and reviewed, correct?

A. Once again, I am not privy to any records that were reports or data that I didn't review in my reports. So the ones that are represented in the reports are the only ones to which I am privy.

Q. I understand that, but it's a simple

question.

The only evidence or information that you have, Doctor, as you sit here today, as to what the blood lead levels were in these four bellwether children at any time are the blood lead level test reports that you received and that you reviewed and that you've testified about so far, right?

A. I believe I've answered that question repeatedly, both yesterday and today. Yes.

Q. I want to talk briefly about your methodology. I think we covered this to some extent yesterday, but I just want to make sure we -- I'm clear on some things here.

Would you describe the methodology that you employed, that you used or carried out to determine whether the plaintiffs' impairments or deficits that you found in your testing and evaluation were causally linked or connected to their exposure to wat- -- the lead in the water?

A. I first interviewed the families and determined what their concerns or complaints about their children were. Then I completed behavioral observations and neuropsychological testing of the children. That included evaluation of their cognitive

and emotional skills. I used the data that I -- we discussed yesterday to obtain a general idea of the kinds of impairments that are commonly seen in this population, in addition to my own clinical experience and my general understanding of the human brain and neuropsychology, and I compared the impairments observed in the testing to the family complaints and to the range of impairments that are seen in lead exposure, and I also considered by way of differential diagnosis any other potential explanations for the phenomena that I was seeing as described in each of the individual reports.

Q. Okay. And how did you go about ruling out the other potential causes or sources of their impairments?

A. This is described in detail in the Conclusion section of each of the reports.

Q. Okay. So your methodology that you used to rule out other potential causes of the disabilities are as you described in the Conclusion section of your report and there is nothing else except what you reported there, is that right?

A. In general -- and neuropsychological reports can be hundreds of pages long if I write down

everything that I am thinking, but the high points are represented in the Conclusions.

Q. Do you recall having done anything other than what's in the Conclusions to rule out other potential causes of the disabilities or deficits that these children experience?

A. That is a fairly broad question. If there are specific alternate causes, I'm happy to discuss them with you.

Q. Well, you know, I -- it is a broad question, but what is your answer? I don't -- do you have an answer for me?

A. Generally speaking, neuropsychologists consider a range of possible options. I don't discuss ones that seem overly implausible or have no evidence or basis in any data, and so when I discuss the conclusions, I don't discuss the possibility that the children were tox -- were exposed to some other substances that I don't know about and that there is no suggestion that they were exposed to and I don't consider other things that are implausible based on their presentation. I considered the ones that are the most high likelihood alternative explanations in the Conclusion sections.

Q. In terms of A[redacted] T[redacted], I have a few more questions following up on the end of our discussion yesterday, and that is, and I think you made mention of this, you noted in your interview or your report of the family history that there was a history of ADHD and anxiety for some of the members of her family.

Is that right, do I have that right so far?

A. The ADHD was in siblings and the anxiety, per my understanding, was in the plaintiff's mother after the water crisis began.

Q. Okay. How -- how did you rule out, if at all, genetic predisposition as the cause of Ms. T[redacted] alleged -- or her neurocognitive and mood disorders that you diagnosed?

A. We discussed this yesterday, but to reiterate what I said yesterday, first of all, I did not think that she had ADHD, and so the genetic inheritance of ADHD would not be relevant.

I also did not think she had an anxiety disorder and so the genetic inheritance of anxiety would also not be relevant.

Q. Did you -- you also noted in your report

that Ms. T[redacted] mother has bipolar disorder.

Is that relevant in any way to any of the diagnoses for A[redacted] T[redacted]

A. I do not see a mention of bipolar disorder in my report. Can you point out to me what you are looking at, please?

Q. Yeah, let -- I will.

That's not coming out clearly in my highlighting here on the report. Let's come back to that. During a break I'll find that reference for you and we'll come back to that one.

Okay. Now let's do what we -- I had mentioned we were going to do earlier, and that is mark as Exhibit 16, and I'll share my screen so you can see it here, the section of the DSM-V that has to do with Other Specified Neurodevelopment -- Neurodevelopmental Disorder.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 16, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. Is this -- take a look at this, and is this the diagnostic criteria that -- from the DSM-V

that you were referring to yesterday when you mentioned that you thought -- you felt that perhaps a more appropriate diagnosis would be other specified neurodevelopmental disorder versus mild cognitive disorder?

A. I discussed that in common clinical use these two terms are used somewhat interchangeably when the question is the impairment of cognitive functions in young children because they are in the developmental period, but this is the -- the alternative -- this is the other diagnostic material that I made reference to, yes.

Q. So just to be -- yeah.

So just to be clear, I think in three out of the four bellwether plaintiffs, that would be T[redacted], V[redacted] and W[redacted], in your reports you have a diagnosis of mild neurocognitive disorder, right?

A. I think that that is correct.

Q. And do you -- are you also -- and then because of our discussion, you said you had some clinical experience recently in discussions with colleagues or something to that effect that you had considered potential other appropriate diagnoses or terms for the diagnoses because they don't fit

squarely within that particular definition or diagnostic criteria.

Do I have that right?

A. As we discussed yesterday, the fundamental problem is that the DSM-V criteria for a neurocognitive disorder talks about decline from prior functioning, but in young children when there is a loss of functioning, it may not present as a decline because the skills are also developing during the time period in question. But, correct --

Q. So --

A. -- yes, this is something that we have discussed in the clinic recently.

Q. So, what I'm trying to get to here is with respect to the three children in which you have in your report made a diagnosis of mild neurocognitive disorder, is there evidence that there was a decline from a pre -- in their functioning in that respect, a modest decline?

A. There is evidence of a modest impairment in their functioning.

Q. And -- but the modest impairment in their functioning, does that -- is there evidence that it declined from a previous level that they were

functioning at before?

A. There is evidence that it is statistically unlikely that it -- that their general skill level would have predicted those skills that are impaired. There is no prior neuropsychological testing that I'm aware of in these specific cases. And so, because these children are developing and because there isn't prior cognitive data, I cannot explicitly point you to a quantitative basis for a prior level versus the current level.

Many of these children were also very young during the times in question. And so, for instance, you don't talk about a decline in the reading skills of an eight-year-old who was exposed to lead at five because they were not expected to read at age five.

Q. So when we go through the testing, which we'll do in a moment for A[redacted] T[redacted] what you are saying is that, for some of the tests, anyway, there is evidence of an impairment of certain neurocognitive functions but that you are not able to say whether there was an actual decline from a preexisting level with respect to that particular skill, is that right?

A. I'm saying that in most of these cases the

question of decline from a preexisting skill is irrelevant.

Q. Well, isn't it relevant to the issue of timing and causation, that is to say, what actually explains or accounts for that deficit?

MS. CARO: Objection; asked and answered.

BY THE WITNESS:

A. As I've explained several times both yesterday and today, when children are developing, these cognitive or other skills become available to them as very develop over time. These children were young at the time in question, ranging approximately, I believe, from age two or three with respect to the 14 patients I examined, up to, I think, about age seven at the end of the crisis for the oldest children by just doing that math in my head.

But these children were all young when these things happened. So, generally speaking, neuropsychologists are interested not necessarily in loss of prior functioning, because the functions in question were generally developing over the course of time in question, but we are concerned with alteration of the trajectory of that development.

(WHEREUPON, a certain document was

marked Mira Krishnan, Ph.D.
Deposition Exhibit No. 17, for
identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. Okay. Let's go to Exhibit 17, which I should be sharing.

Can you see this on your screen?

Doctor, I -- I just want to make sure you can see it?

A. I'm sorry. Who is Sharon?

Q. I am right now. Can you -- can you see it?

A. Oh, I can see it, yes.

Q. Yeah. Yeah. So --

A. I thought you were directing that question to someone other than me.

Q. Nope. I'm only -- only asking you questions today.

So, what I mentioned before was that I'm not going to mark your report separately. Actually, yeah, this one is. Okay. I stand corrected.

This Exhibit 17 contains both your full report on APPI TPPI, but it also has all of the data from the testing with it. What I mentioned was

when we get to the next two reports, I'm not going to re -- mark your report separately because it's contained in the report or the document with the raw data.

So let me just get this view oriented correctly and we'll take a look at this.

So, all of these raw data compilations, and they are all approximately 120 pages like this one is, they follow the same basic format, right, you have the raw data, the test reports, the scores and everything, and they all start out with this sort of cover sheet that describes what tests you administered, right?

A. That's correct.

Q. And show me on here, point out to me which of these would the -- would the norms for the scoring be contained in that textbook that we talked about?

Is it this one right here that I'm highlighting, the -- can you see my cursor, the TMT? Oops.

A. Yes, that's correct. That one and then in the third column at the top, GPT, the same two tests that we previously discussed.

Q. I see.

So, my cursor is going -- I'm not able to get my cursor over to the shared screen right now.

A. I'm not an expert in IT either. Sorry.

Q. No, I wouldn't -- okay. There is one where I'm not asking you the question. I need help from Dave on this one.

MR. ROGERS: Something happened, Dave, where I now can't get my cursor over to my shared screen. Let's go off the record for a second. Sorry about that.

THE VIDEOGRAPHER: Off the record, 9:33 a.m.

(WHEREUPON, discussion was had off the record.)

THE VIDEOGRAPHER: Back on record, 9:35 a.m.

BY MR. ROGERS:

Q. Okay. Sorry about that snafu there. We are -- we are back in business here.

So, with respect to the remainder of the tests, Doctor, besides the TMT and the GPT, the norms for scoring are all contained, as we discussed before, in the actual scoring kits for the individual tests that you described yesterday for -- for this particular plaintiff as well, right?

A. In looking at the tests that were

administered, the tests are the same tests and the answers are the same answers as provided yesterday.

Q. Yeah. So, I mean, but with respect to the scoring and the answers, my question was: The same norms for scoring those are contained within the test kits themselves for each of the individual tests, right, the publishers of the test?

A. As we discussed yesterday, there was one of the tests where the norms are actually on the second page of the test and are so included in the document that I gave you, but for all of the others, yes, the norms are in the test kits or manuals.

Q. I -- I appreciate that. Thank you.

Remind me which one of those tests contains the norms for the scoring on the form itself, which one?

A. That's the Tower of London, Drexel Edition, it is indicated as TOL-DX in the left column.

Q. Got it. Thank you.

So, having looked at that, I want to go back to -- and this -- this should be a -- a little bit more efficient than the way we did it yesterday. I'm going to go to your report where it has all of these tests, and I know that you've summarized them in

a different section of the report, but if you wouldn't mind, just tell me for all of these tests in the section here on your report, Pages 5 through -- 5 and 6, I guess, which ones did you find any abnormalities or deficits in your testing of A[redacted] T[redacted]?

A. So, I believe we discussed some of this already yesterday, but starting with the WISC-V --

Q. Uh-huh.

A. -- on the first page, the score SI = 5 is a similarities. It is a test of verbal reasoning that is impaired.

Q. Okay. If it's an SI 5 level, to what extent is that impaired?

A. Psychometrically it is considered mildly impaired.

Q. What would be the score that would be required for it to be not mildly impaired?

A. Are you asking for a score that would be considered normal or are you asking for a score that would be considered more than mildly impaired?

Q. No. You said it's -- she said -- you said that this score, 5, represents mildly impaired, right?

A. I did, yes.

Q. What would the score have to be in order

for it to be more normal than mildly impaired, the next level up?

A. Okay. That's -- that's the question that I just asked you. Seven or higher.

Q. Okay. Thank you.

Okay. Any others?

A. I discuss in the report some of the pattern differences, like the -- the pattern difference between word reading and math computation, but those scores are not considered impaired as discussed in the report.

The next impaired score is --

Q. I'm sorry --

A. -- is TMT-A which is --

Q. I'm sorry. Excuse me.

The word reading and the math computation, that's from the WRAT5, right?

A. That's correct.

Q. I -- I just wanted to make sure we aren't still in the WISC-V. Okay. So I understand what you are saying there. Yes.

Please go on. I -- were you on the TMT now?

A. Yes. So the TMT-A Z score of minus 1.8 is

impaired.

Q. And what does that refer to?

A. What do you mean, what does that refer to?

Q. What -- what's the TMT-A?

A. So this is a question I answered yesterday, but this is a test of --

Q. Doctor, Doctor, Doctor, Doctor, Doctor, excuse me.

So, when you -- when you keep interjecting this is an answer that I -- a question that I answered yesterday or you make comments to the effect like you did yesterday that any neuropsychologist would know the answer to this question, I'm going to ask you not to do that, okay, because it's -- it's causing delays and it's just not helpful.

So I'm asking you the questions, I would like you to please answer my questions and not have the commentary about whether you've answered it before or whether anyone else would know the answer to the question, okay.

Would you do me that favor going forward.

So, please explain what is the TMT-A test about?

A. It is a test of visual scanning and rapid

information processing.

Q. All right. And what -- is there other -- any other test that reveals any other deficits for Ms. T[redacted]?

A. The next test is on the next page at the top.

Q. Okay.

A. So, this test has a number of different scores. If you scroll up a little bit so that you can see the top of the prior page, it begins where it says "NEPSY-2."

Q. Um-hum.

A. All of those scores are part of the same test and are discussed together in the preceding section, but the -- the test is called Auditory Attention and Response Set. It is a test of sustained attention and response vigilance. A[redacted] did adequately with the easier component, which is auditory attention, that those are the scaled scores that are at the bottom of that page, but she was impaired with the more difficult condition response set which is at the top of Page 6.

Q. On all of those or just some of those that are listed there?

A. The scores are considered -- I know that you don't want me to point out that I've -- we discussed this yesterday, but as I previously mentioned, neuropsychologists don't go through scores line by line and say this is impaired, this is intact, this is impaired, this is intact. I am answering your questions at your request, but this is not typically the way that people in my field consider the data.

The correct total score in the first line and the combined total score in the last line are impaired. The overall result is one that I consider impaired.

Q. Okay. Any others, meaning any other evidence of any deficits or impairments based on your testing?

A. For the cognitive skills, no.

Q. Are there some test results here that are supportive of or evidence of the mood disorder that you diagnosed in A[redacted] T[redacted]

A. That is primarily the BASC-3. The index scores are indicated here. If you would like to go through the line-by-line impairment, I would direct you to the BASC score report form which is much further down in the document. I believe it is on

Page 92 of the overall PDF file.

Q. Thank you. Let's do that.

Okay. I remember we looked at this similar type of form for Mr. S[redacted], right. So, okay, yeah, explain this to me, please.

A. The general way that these scores are interpreted is the same. There are -- questions asked may vary slightly from child to child, although I believe that in the case of E[redacted] and A[redacted], the ages are -- are close enough to the same that the same questions are being asked.

The -- the questions, again, decompose into different content areas of behavioral and emotional functioning and are adjusted based on the child's age at the time of report. And, again, as you see on the screen, the dark gray areas are considered clinically significant by the test publisher, the light gray areas are considered at risk, and percentiles are also included just below the bottom of where you are currently on the screen.

But so, as described in the report, the primary area that was impaired was the social skills area where A[redacted]s social skills were described as worse than 97 percent of comparison population. There

are -- because these publishers use different standards for what is considered clinically significant, and we also consider the base rates of different kinds of disorders, it is common for psychologists and neuropsychologists to also look at some of the items that are in the light gray area, particularly to note if they fit a pattern, and so in APPI s case, her mother is also reporting fairly low levels of adaptability, fairly high levels of social withdrawal, and some other problems that are relatively more minimal.

Q. So remind me, that the BASC-3, is that a test that's administered by interviewing the parent?

A. It is a test that is a questionnaire that the parent fills out directly.

Q. That's right, okay. You told me that. You did tell me that yesterday, that's right.

Okay. And that's how you performed it or you had the mom do that in this case for Ms. TPPI, right?

A. That's correct.

Q. Okay. I think that concludes the questions for Ms. TPPI. Let's move on to RPPI VPPI .

MR. ROGERS: Let's mark as Exhibit 17 --

THE COURT REPORTER: Exhibit 18.

MR. ROGERS: Right. Thank you. Exhibit 18, this is the full record for your -- which includes your report, the forensic neuropsychological evaluation, and all of the underlying test data and reports for R[redacted] V[redacted]. And as I did with the other plaintiffs, I'm going to ask you some background first.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 18, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. So, as of the time of the evaluation which you did, and the evaluation was June 27th of this year, 2020, right?

A. Correct.

Q. And so that meant that R[redacted] Va[redacted], she was 6.8 years old or six years, eight months old, right?

A. Are you intending to share the screen at this point?

Q. I am. Sorry. You are right. I haven't

done that yet. Thanks.

Got it?

A. Yes.

Q. So she is six years, nine -- eight months old as of that time, and she had just finished the first grade, right?

A. Correct.

Q. I'm going to ask you some questions about what you know about her reported blood lead levels based on the reports that you reviewed and that you reported on in your report for R[redacted] V[redacted]

The first reference to a blood lead level is on Page 1, which I'm highlighting here, and similar to some of the reports that we saw yesterday, on November 3rd, 2014, there was a negative blood lead level assay test that was done, right?

A. That is my understanding, yes.

Q. And then the next one appears on Page 2. I'm highlighting it here. On the -- sorry -- I missed one up top here.

On September 2nd, 2015, the blood lead level was reported as .7, right?

A. That's my understanding based on reviewing the records.

Q. And then on January 14th, 2016, another blood lead level test was done and the amount was -- the measurement was 1.3 micrograms per deciliter, right?

A. Again, that -- that is my understanding based on reviewing the records. I did not perform these blood assays.

Q. And then based on the records, the last one that you are aware of is this blood lead level that was done on May 22nd, 2017, .5 micrograms per deciliter, right?

A. To the best of my knowledge, the only other test after that was the bone lead test that is lower on that page.

Q. Right. But I -- I'm just -- based upon the information that you have, she was tested on May 22nd, 2017, and the blood lead level was .5, right?

A. Correct.

Q. And as we also discussed yesterday, is it also true that with respect to R[redacted] V[redacted] blood lead levels that were measured and based on these test, you have not looked to do a -- or done an analysis of how that compares to averages for children

who at this point would have been between age one and three, right, national averages?

A. My answers to that questions -- that question are the same as they were yesterday, yes.

Q. Yes, meaning you haven't done that analysis, correct?

A. Correct.

Q. Okay.

Let's go to page -- the page that has your diagnosis, just as we did the other day for RPPI . Or just as we did yesterday with the other plaintiffs.

Okay. In your diagnosis, your diagnosis is: "...mild neurocognitive disorder...which is more likely than not a result of developmental lead exposure," right?

A. That is what the page says, yes.

Q. And I just wanted to make sure for RPPI that your testimony is the same concerning the Other Specified Neurodevelopmental Disorder from the DSM-V that we marked now I think as Exhibit 15.

Is there -- having considered it more, do you think that that's the more appropriate diagnosis than the one you have in your report?

A. I -- all -- all of my prior answers are --

apply to the same issues and the same issues are present with R[redacted]. There is a cognitive -- there is a cognitive problem that has the same issues of developmental nature that we discussed in the prior case with A[redacted].

Q. So where do you come down on this, is it a blend of the two DSM criteria or is it the Mild Neurocognitive Disorder or is it the Other Specified Neurodevelopmental Disorder?

A. I come down in believing that the DSM-V is not purely authoritative in defining the diagnostic criteria for disorders and that rather neuropsychologists should consider all of the available scientific evidence. But the way that the DSM-V describes the two disorders, the condition is really a blend of the two.

Q. In what respect is it a blend?

A. There is a mild impairment -- there is a modest impairment in cognitive functioning as described in the neurocognitive definition in the DSM-V and there is a developmental aspect to the disorder as described in the other condition.

Q. I see.

So with respect to R[redacted], is your answer

the same as it has been with -- with the other two plaintiffs, that in terms of determining whether there has been a decrease or a decrement in a prior level of cognitive performance, you are not aware or you don't have any evidence to support that for RPPI ?

A. Again, as with the prior case of APPI , it's my opinion that that question is irrelevant because in RPPI case RPPI was 6-1/2 years old, approximately, when I saw her in 2020, and so during the time period in question, she was very young. In 2015 she would have been 1-1/2 years old, and so, for instance, a child would not be expected to lose reading abilities that they had at 1-1/2 or attention abilities that they had at 1-1/2 because those abilities had not yet been developed.

Q. Okay. Let's go to your recommendations here, just as we did with the others yesterday.

You say with respect to RPPI that you estimate, do you see this section here?

A. Yes.

Q. Just like similar to what we looked at yesterday for one.

"I would estimate a 25-50% likelihood that RPPI may require future tutoring services (up to one

hour per day) or a future individualized education plan, although she is appropriate for placement in a mainstream classroom."

What is that based on?

A. The answer to that is -- is substantially the same as the answer I gave to the similar question previously, meaning that I do not have a direct source to provide you a quantitative specific estimate, but this is the best approximation I can make based on my clinical experience with this population.

Q. I think you described the evidence or the basis for that is your anecdotal experience with your clinical patients.

Is that true with respect to your estimate here for R[redacted]?

A. Yes, similar to A[redacted] case, I'm not aware of a large sample of children who have exactly the same cognitive profile from which I could draw an answer to that question, and I do not have a quantitative database of my own that I could use to answer that question.

Q. The second recommendation that you have here says, that I've highlighted now: "While IQ at the current age is not a completely predictive" --

"completely predictive of long-term outcome," what was her IQ measured in the FISQ (sic), actually, what was that?

A. It was 92.

Q. And where does that fit within the average or normal range or where does that fit?

A. It is average. It is a little lower than the other IQs that we discussed yesterday. I don't have a percentile in front of me, but it is somewhere around, I believe, the 35th percentile and so roughly two-thirds of children her age perform better than her and roughly one-third perform worse than her. That's my estimation without getting out a calculator.

Q. And so you say here that with -- "While IQ at the current age is not completely predictive of long-term outcome, individuals at this intellectual level are generally able to graduate from high school with a diploma."

What -- what's the "generally" refer to?

A. I did not see in R[redacted]case factors that would cause me to think that she has a substantially statistically elevated likelihood of dropout.

Q. Okay. Thanks.

Is that true for college as well as high

school?

A. Based on my general knowledge, I think that it is -- it is not -- it is difficult to make a quantitative statement because R[redacted] is very young. She would go to college approximately 12 years from now, and I don't think that there is enough stability in testing at age six to make a strong statement about that.

Q. Is that also true with respect to her potential for success in a skilled vocation versus unskilled vocation?

A. So, the -- when I was a child my mom listened to a lot of financial television and they would say that the best predictor of future returns is past performance.

Given the data that I have available, the most reasonable assumption is that the deficits seen today would be deficits that would continue in the future. There is no assumption that is more justified by the evidence than that.

I think that there is probably some reduction in her functioning, but I am not able to provide a quantitative degree of that reduction. And I do think that some of the skills that she struggled

with would be important for many skilled vocations, but I am not able to quantify that.

Q. There was some information in some of the scientific literature that we looked at yesterday with respect to, some statistical data anyway, on increased risk for children diagnosed with ADHD that we talked about for EPPI SPPI

Do you have any scientific literature or data with respect to the potential for RPPI VPPI to complete either high school, college or engage in skilled or unskilled vocations?

A. So, in RPPI case I did not think that she had a current pattern that was consistent with ADHD. I also didn't see a clear pattern that was consistent with nonverbal learning disorder. That's discussed on the top of Page 8 of the report.

The reason I mention that is I believe that I also provided you references that discuss long-term outcomes from nonverbal learning disorder. I don't think that that is something that we discussed yesterday, but -- but that's the other closest source of information that I have available.

Q. Well, let me make sure I understand.

Do you or do you not think that based on

the evidence you can opine as to whether or not R[redacted], based on her testing and her -- the evaluation that you did, has an increased risk of graduating from high school or not?

A. I'm not able to quantify that.

Q. The same question with respect to college?

A. I'm not able to quantify that either.

Q. The same question with respect to engaging in a skilled vocation versus an unskilled vocation?

A. I am not able to quantify that either.

Q. What is the literature that you are referring to that has some analysis of the future potential for kids with, what was it, the deficit that she had that you just described?

A. There -- there -- I believe -- I have to look more closely at this literature, but I believe it is the Margolis reference that's in the -- the reference list I provided you.

Q. What -- what -- which specific deficit does that literature refer to or describe?

A. Nonverbal learning disorder.

Q. Okay. Let me just take a quick look at that.

So is that the 2020 paper, Margolis, et

al. "Estimated prevalence," et cetera?

A. Correct.

Q. I see.

Okay. Well, what I'm going to do, then, is I've already got all of the exhibits lined up and marked in order, so let me mark this one as -- I'll bring it up -- I'll share the screen so you can see it. And then we'll mark that one as -- let's see, I'll figure that out in a minute.

A. The -- but as I'm looking at that paper, it doesn't really provide any quantitative information about long-term outcomes, and so I think that the -- the issue is really limited in terms of what we know or that what we have in the scientific literature to make statements, which I believe is what I had already said in answer to the prior question.

Q. All right. Well, we have the paper, so that's good. We don't need to mark it based on that -- that answer. Thank you.

Let's go back to the V[redacted] child in terms of recommendations and -- and what the future might hold.

Do you remember yesterday that we discussed, at least for the ADHD diagnosis for

SPPI, and I think also for the -- some of the deficits that TPPI APPI TPPI exhibited, for any of the deficits that you found in RPPI VPPI that you've gone through in detail, are -- are there any specific coping mechanisms or teaching skills or treatment that would help her to enhance her performance in those areas in which she has deficits?

A. In RPPI case, it -- well, in RPPI case some of those deficits fell in areas that have to do visual processing and visual reasoning. What I had noted in my report was that while she had those deficits or lower scores in those areas, she had normal academic functioning, which is why I recommended that she may need an IEP in the future but that I wouldn't be able to recommend one at present.

So, in terms of treatments that are used for this kind of -- these kinds of thinking or learning problems, it is -- there -- so at the -- the Margolis paper that we started discussing talks about the issue that the condition is only now coming to a point where there is a clear prevalence estimate. And so in my experience, the -- the treatment is not as standardized as some other conditions for these nonverbal learning problems.

What I recommend to patients that I see with these kinds of thinking problems are sometimes occupational therapy is helpful, occupational therapists have some skills in remediating visual kinds of tasks, functioning, sometimes I recommend that youth with these kinds of problems have extra emphasis in things like structured training in the arts, like drawing or painting, because that tends to enhance visual functioning.

And then, if the child starts to show these problems in core academic areas in the future, which is typically they are seen in math, in the second to fourth grade kind of range, then -- then the -- the IEP recommendations would be for special education services or a response to intervention services is another term that teachers use that would remediate those skills at that time.

Q. Are those treatment or compensa- -- go ahead, sorry. Are you going to say something else?

A. Correct.

Unlike ADHD, this is a condition that would not typically be treated with medications.

Q. Yeah. Thank you.

Are -- are those treatment modalities or

compensatory skills and extra tutoring and stuff of the type that you described generally successful?

A. In my experience, when children do these things, they do help. They -- they -- I don't know that I can make a quantitative statement about that, again, because of the lack of standardization of care in this area and because I don't have a database to make a quantitative statement based on myself, but, yes, they are generally beneficial.

Q. Are there any other deficits or impairments that you found in R[redacted] that would be susceptible of treatment, compensatory-type approaches or anything, skilled teaching that you described for any of your -- her other deficits?

A. I am just looking at my report myself.

So the -- I did not see in her case a strong pattern of the frontal executive deficits that are seen in conditions like ADHD. There were some problems with aspects of learning that -- that, yes, would generally be amenable to interventions that have to do with teaching children meta -- meta cognition or -- or meta learning, meaning learning how to think or learning how to learn.

Q. Okay. Anything else? The question being:

Are there -- are there any --

A. That's it.

Q. Okay. Thank you.

Yesterday I asked you a question about since it's -- and I'll ask you about R[redacted] now the same question.

Since it's your view that these deficits that you found were caused by developmental lead exposure, is it true that if there is no continuing exposure to lead for R[redacted] V[redacted] that the symptoms will diminish over time?

A. So, we had a -- we had a discussion about neuropsychologists lacking crystal balls yesterday and that certainly applies here as well.

In R[redacted] case, there is -- was already evidence of peaking and reducing blood lead levels, as discussed in the Conclusion section of my report. If her levels continued to normalize, then, yes, I would suspect that there would be mitigation as a result of that, of any of these deficits.

Q. Okay. When you say that her results would normalize, I'm -- I want to make sure I understand.

What -- what do you mean by "normalize"?

A. I mean that if she continued to have blood

lead levels that trended in the direction of negative and stayed there, then I would expect that that means that her cumulative lead exposure period has now closed and that I would expect that gradually the lead that has accumulated in her body would circulate back into the blood and excrete and -- and as that happens I would expect that there may be some attenuation of any deficits that are being caused by lead.

Q. Let's do what we did for -- with the other plaintiffs, looking at the actual scoring information for her. So I'll bring her record back up.

THE VIDEOGRAPHER: Don't forget to share your screen, David.

MR. ROGERS: Yeah, I got it. That should be up now. Thank you.

BY THE WITNESS:

A. He's doing it right now.

BY MR. ROGERS:

Q. It takes two clicks, so bear with me. It takes just a couple minutes here.

A. Sure.

Q. So I want to look at the raw test data for a minute and do what we did before. And I -- I know, listen, Doctor, to some extent this is somewhat

repetitive, but, please, just bear with me. I just want to do this in a certain pattern so that the record is clear.

So, I am now on the page of your report which summarizes the test results that are tabulated, and I'm just going to ask you if you would please tell me for which of these test results, point out to me the ones that report abnormalities or deficits that I know you've already described, but I want you -- want you to show me where they are on these tabulations of the results here, okay.

So would you please do that?

A. Could you please clarify? We were talking about RPPI VPPI, but this is, I believe, DPPI WPPI report.

Q. You are right.

A. Have we changed topics?

Q. No, I didn't intend to, so that was a bad -- bad share. So let me get back to RPPI VPPI, thank you, which is Exhibit 18. We'll get to WPPI in a minute, but you are 100 percent correct. Thank you.

A. I just saw numbers I didn't recognize because I was looking at a different report than you.

Q. Yep, you are right.

Okay. So here we are with R[redacted] V[redacted]. So go through these test scores and results here, the tabulations, and tell me which ones are the ones where you found evidence of some deficits or decrements?

A. Okay. You are not yet sharing your screen.

Q. Oh, here we go again. Sorry.

A. Sorry.

Q. No. Thank you.

A. I hate to keep calling you out on that.

Q. No, no, please. Thank you for telling me.

Now can you see it?

A. Yes.

So, I mentioned with discussing A[redacted] that, when we were talking about the BASC a moment ago, I mentioned that we pay attention to scores that are -- that cluster lower than other scores, in addition to psychometrically impaired scores, and I'll tell you briefly about both kinds of issues.

If you look at the WISC-V which is the second test in the Tabulated Results section, Figure Weight -- Figure Weights, FW, which is under -- so I

apologize for the abbreviations, but the third line under WISC-V, Fl Reas stands for Fluid Reasoning. These -- these are tests that have to do with novel problem solving using visual information. Figure Weights is the second one of those, FW, and that is psychometrically impaired.

The -- another visual spatial test was low average but not impaired, and that was BD on the line above, which is block design which is a task that requires construction based on visual stimuli.

Q. Okay. Thank you.

Is that -- what's the next one?

A. The next one is under CVLT-C, further down the page.

Neuropsychologists, again, just to clarify, I'm not attempting to insult your intelligence, but when you go to the doctor and you get a complete metabolic panel or a complete blood count, you get a lab result sheet that has 20 indicators on them and most of them are normal. The way that a flexible battery works, we test a wide variety of areas, not necessarily expecting all of them to be impaired, and so I'm just skipping the ones that are -- that are not impaired, which is normal in

most populations.

Under the CVLT-C, the -- the score that was impaired is the Trial B score, which is in the second column, the second row. The Z score is minus 2, which is two standard deviations below the mean. And -- and that is worse than about 95 percent of age peers. That is described in the report in the third paragraph under Testing -- under Test Results on the prior page. It is a test of memory interference.

So essentially when -- the format of the CVLT-C, which, again, stands for California Verbal Learning Test for Children, the format of the test is that a child is asked to remember a list of information, it's presented several times so that they can learn successively over the trials. There after that is a distraction test where a different set of information is provided.

Generally speaking, we are able to look at two things with this. One of them is something that psychologists call single trial learning, which means what it sounds like, can you learn information if I just tell you once. And you can imagine how that would be important in a variety of settings.

The other thing that this potentially

indicates is a kind of frontal executive functioning that we call interference, and so interference means that you -- in order to pay attention to things, your brain has structures and functions that allow you to select whether you need to pay attention, what you need to pay attention to. If you think about your own life and if you are having a problem, you are stuck in a certain sort of thinking path and you need to -- people will say something like, I need to do a reset, that's a frontal executive kind of function.

And in this case, because R[redacted] had normal Trial 1 performance but impaired Trial B performance, it is this latter type of problem that this represents, in my opinion.

Q. Okay. Thank you.

Anything else?

A. The scores for the Wisconsin Card Sorting Test, this is the WCST-64 that's immediately below that. I apologize. That equal sign in the first line should be a hyphen. So that's the name of the test. WCST stand for Wisconsin Card Sorting Test.

The -- those scores are right on the edge of psychometric impairment. If a standard for psychometric impairment of 1.3 standard deviations is

used, then a T score of 37 is considered impaired, but a -- it is more than one standard deviation below average and there are multiple variables on that test that are abnormal or subtly abnormal, and because I had already seen another kind of executive deficit in the CVLT-C as described in the report, I did consider the -- the performance in the Wisconsin Card Sorting Test as potentially correlating with that earlier finding.

Q. All right. Anything else?

A. The -- the remainder of the cognitive testing I read as normal. And I also read the measure of adaptive functioning, the Vineland, and the measure of behavior functioning, the BASC, as normal as well.

Q. Okay. Thank you.

A. If I go -- if you bear with me for one second, I can talk to you about -- sorry. One moment, please.

The -- the BASC score form that we looked at for the previous children is on Page 96 of this PDF file, and if you would like, you can quickly look at that, but it is normal.

Q. I see. That -- I have this up on the screen now.

A. And see -- yeah, here you see that, correct, and so you can see that on the screen that all of the dots are in the white area and so we consider this -- this is totally normal.

Q. Okay. Thank you.

Does that complete a description of the test reports in which you saw some findings that represented evidence of any deficits or impairments in RPPI VPPI

A. Yes.

MR. ROGERS: All right. I think we are ready to move on to DPPI WPPI, so it's about 10:20 or so. Let's take a five-minute break. And we are making good progress here. I -- I'm optimistic that we can finish, you know, around lunchtime depending on the other attorneys questioning.

So we are making good progress here. We are moving right along efficiently. Let's take a five-minute break, please.

THE VIDEOGRAPHER: Going off the record, 10:23 a.m.

(WHEREUPON, a recess was had from 10:23 to 10:31 a.m.)

THE VIDEOGRAPHER: Back on record, 10:31 a.m.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 19, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. Okay. Dr. Krishnan, what I have up on the screen now, I hope you can see it, is Exhibit 19, which is the full record including your report and all the underlying test data records for D[redacted] W[redacted].

So just to go over the basics here again like we did before, the date of the evaluation for her that you did was June 26th, 2020, right?

A. Correct.

Q. And she, at that time, was 11 years and 1 month old -- or sorry -- 10 years -- 11 years and 10 months old, right?

A. Correct.

Q. And she had just finished the sixth grade, right?

A. Correct.

Q. In terms of the information that you had about her blood lead levels, I want to show you this first one.

Okay. The ones that you had in your

records, the first one that you had was reported here on Page 2 on March 28th, 2016, she had a negative blood lead study because it was less than the 3.3 micrograms per deciliter, right?

A. Correct.

Q. And then on the --

A. There is another one that's in that same paragraph. The -- the date is not right next to it, but on 7/5 -- 15/16 she saw her primary care physician and she had, based on my understanding of the records, a venous blood lab on the same day and that's that 0.6 micrograms per deciliter.

Q. Thank you. That is the one that I was looking for. So the other one is -- was measured at .6.

And just not to belabor the point, but with respect to DPPI WPPI, similar to the other plaintiffs, you haven't compared these -- or this report of .6 to the average of kids her age at that time nationally, right?

A. Correct.

Q. Now, you did mention in your report that you had seen from the deposition transcript that there was a -- another blood lead level measurement that --

for D[redacted] W[redacted] from September 25th, 2009, that was measured at 2 micrograms per deciliter when she would have been one year old.

Do you recall that?

A. Yes.

Q. Did you actually see that blood test report in -- in your records that you reviewed?

A. No. That -- that's the reason it's only described in the Deposition Review.

Q. Okay. Let me see if I can find that for you so that we can show that to you.

Okay. Can you see what I have up on the screen now?

A. Yes, I can.

Q. So here is the record that I believe was marked in -- as an exhibit in the -- in the deposition that you described in the -- the -- your report. You can see that it's for the play -- patient D[redacted] W[redacted], date of birth [redacted]2008.

It's for a sample received September 25th, date collected, 2009, and it has a recording here: "Lead interpretation: Blood lead in children, 9/25/09."

And here is the number right over here,

and the reference range you can see is the same as the other reference ranges, micrograms per deciliter, and it has got a -- a measurement or a test result of 2.0.

Do you see that?

A. Yes, I do.

Q. Is -- what significance does -- assuming that it's accurate, what significance does this have to any of the opinions with respect to her that you -- that you hold?

A. So, the -- this lead level is the highest blood lead level that I am aware of for D[redacted]. It was clearly collected long before the -- the Flint water crisis happened, if it's okay if I call it that. It occurred before the change in the water system to the Detroit -- from the Detroit River or back to the Detroit River.

What is challenging with these blood labs in general is that some of them are -- again, I'm not a blood -- a cap -- a blood lab expert, I'm not a phlebotomist or a -- I'm not -- I'm not the appropriate expert for that, but to the best of my knowledge, the -- some of these blood labs are capillary draws and some of them are venous draws.

Based on my understanding, the relevance

of that is that the capillary draws have a high threshold for minimal detection. That's the -- I think that -- I've -- I -- I believe, although I am not sure, that in the case of all of the labs that are resulted -- reported as negative, below 3.3 micrograms, that those are probably capillary draws, whereas, like, in this case this is presumably a venous draw because the level is only 2 and the -- the other one that we just discussed is presumably also venous. I -- I think, actually, that one was reported as venous.

The reason I say that is that because it is plausible that she had high lead level continuously during this time. I just -- I don't have any information about her lead exposure or lead levels between 2009 when she had a positive draw and 2017 when she had the -- or I'm sorry -- 2016 when she had the next positive draw.

Q. Okay. That's interesting. So --

A. So that it --

Q. Go ahead.

A. No, I'm sorry.

So, it's hard to make a conclusive statement about that, but it does certainly raise the

possibility that -- that she had some -- I'm sorry, let me rephrase that.

She has evidence of lead exposure prior to the water crisis.

Q. And I think you said just a moment ago, correct me if I'm wrong, that it's plausible that she had an elevated lead level from 2009 up until 2016.

Did I mishear you?

A. It -- it's within the realm of possibility but I can't comment on whether it's probable or not.

MR. ROGERS: Let's mark this as an exhibit.

Would this be -- this is going to mess up my numbering system, Juliana, but so be it. Is this one now going to be 20 or 19?

THE COURT REPORTER: Twenty.

MR. ROGERS: Thanks.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 20, for identification, as of 10/06/2020.)

MR. ROGERS: Okay. That won't mess it up too much, Juliana, because we only have three more, so we'll just revise those on the fly here.

BY MR. ROGERS:

Q. So I brought -- excuse me -- I brought back up Exhibit 19, which is the full record for D[redacted] W[redacted], where we had highlighted those blood lead levels that you can see on Page 2 of the report.

So I want to do what we did with the other plaintiffs, we'll go to your Diagnostic section, which is at the end of your report here on Page 9 in this case.

Without, you know, having to go off -- over this all again like we did before, but just see if we can move through this efficiently, your -- your diagnosis based on your evaluation and your -- the history that you took, et cetera, et cetera, for D[redacted] W[redacted] is: "...mild neurocognitive disorder...which is more likely than not a result of developmental lead exposure," correct?

A. Correct.

Q. And is it also true that in thinking about it some more, as you did with the other two plaintiffs whom you diagnosed with this condition, that you believe it's more -- a more appropriate diagnosis at least using the DSM criteria would be for the Other Unspecified Neurodevelopmental Disorder?

A. So, the -- my answer is the same, but as I

have said previously, I believe that if the DSM-V is used as a strict source of criteria, then the condition is somewhere in between this and the DSM Unspecified Neur- -- the Neurodevelopmental Disorder that we previously discussed.

Q. Okay. Now, you know, D[redacted] is older than R[redacted] right, and she -- she was quite a bit younger. D[redacted] when you saw her was almost 12, I guess.

Do you have an opinion as to whether or not there is evidence of a decline in D[redacted] W[redacted] cognitive performance in any particular areas, or is it that what you -- your opinion is that the -- she simply has deficits but you can't specify as to whether there has been a decline from a previous functioning level or not?

A. I do not believe that I can make a quantitative statement about that. In -- in D[redacted] case, there is more detailed school record information than there were for some of the other bellwethers, but in my review of that school information, the pattern is inconsistent from report to report, and so I do not think that that is clear enough to be able to infer declines in functioning.

And I'm not aware of any prior neuropsychological testing.

Q. Right. Okay. Let -- let's just be clear about that too.

In -- in any of the education records that you've seen, I think I'm correct that -- and -- and tell me if this is right -- that there were no neurological psych -- psych -- sorrow -- sorry, let me restart -- no neuropsychological testing of the batteries of tests that you performed on these plaintiffs had been done in any of the records that you've seen before, right?

A. With respect to the four bellwethers that we are currently discussing, that's correct.

Q. Right. Okay.

So, to the extent that you saw inconsistencies or reports in the education records, what -- what types of -- with DPPI, that is, what types of reports are you referring to in terms of these inconsistencies that you've described?

A. That is in -- on Page 2 of my report at the bottom, the full paragraph -- the paragraph that begins at the -- about halfway through the page and then continues to the top of Page 3.

During this time period there were generally satisfactory ratings for D[redacted] up until around 2016. After 2016 she was noted to, I'm quoting myself: Have fair to poor citizenship, needing supervision, disregarding suggestions and being frequently disruptive. She had a decrement in grades at that time. In 2017 and '18 similar reports were made by the school, although not in every marking period. And she had a non-proficient language score in the M-Step in 2018, I believe, and -- and then in 2018 to 2019, similar issues were noted that were not noted in prior notes from the school.

Q. I see.

On Page 3 of 9 of the -- of your report there is a reference to her having been disruptive during MAP, M-A-P, testing, and then you note parenthetically that: "(As an aside, I did not receive that MAP testing to review.)"

What did you mean -- what's MAP testing and why did you make that statement?

A. MAP, M-Step and NWEA are various standardized -- more or less standardized assessment tools for -- that schools use. I'm not a teacher and I'm not an expert in these particular tools, but they

produce psychometric scores, typically including things like percentile scores in academics that are reasonably comparable to the percentile scores in academic tests that I use like WRAT5.

Q. I see.

So, having noticed that in your report --

MR. ROGERS: Patrick or Louise or Corey, is there some reason why that hasn't been received from the school or is there a way that we can get that, what -- what's the story on that, does anyone know?

MS. CARO: I'm not sure. I'll have to get with Corey and Patrick to find out, unless they have an answer for you now.

MR. ROGERS: Yeah, okay. Let's do that. And I'll -- I -- I had offered to make sure that I'll circulate a list of a couple of additional things that we are looking for, so let -- that will be on the list because we don't have that testing either, so let's see if we can get that.

BY MR. ROGERS:

Q. Okay. Thanks for that, Doctor.

The -- would you explain -- and, again, I know it's in your report, but explain to me the basis for your diagnotice -- diagnosis of D[redacted] W[redacted] as

having a mild neurocognitive disorder or sort of a blend of that and in between other unspecified neurodevelopmental disorder?

A. So, the easiest way to do that would be to look at the test results, as -- as you requested for the previous bellwethers. Excuse me. So I found impairments in visual and spatial processing with a significant discrepancy between verbal and fluid reasoning skills. And so if you want to look at the scores, which we have done previously, the WISC-V, if you look at the -- the third line below that for fluid reasoning, here the Matrix Reasoning and Figure Weights are both measures of -- of fluid reasoning or visual reasoning, and they are both impaired.

If I use the staid -- same standard of impairment of 1.3 standard deviations below the mean in the measurement metric that's used for IQs, that's a measurement of 80 or low -- or lower. And so the FRI, which is in the line that's marked Indices, which is 74, that index is composed of those two fluid reasoning measures, and so you see that that is also impaired.

Moreover, you -- as a -- as -- as described above in the report, there is a large

discrepancy between the verbal reasoning and the fluid reasoning. Quantitatively that is the difference between that VCI score of 100, which is composed of the first two tests in the verbal -- or the -- the -- the line marked "verbal" and the FRI, which is the Fluid Reasoning Index. Sorry. VCI stands for Verbal Comprehension Index, FRI stands for Fluid Reasoning Index. And so the difference between those two is 26 points, which is close to two standard deviations of difference and is relatively rare in the general population.

Q. Okay. And the -- the Full Scale Intelligent Quotient, FSIQ, that's a 91.

Does that put her in the basically 50th percentile for her age group?

A. I would have to look at a percentile calculator, but it is more like the -- somewhere around the 30th percentile.

Q. Okay.

A. But it is considered normal.

Q. Yep. Okay. Let's -- let's do that.

So I -- I had asked you to -- to explain the basis for your diagnosis based on your evaluation and testing, and you were beginning to do that, and

you've told me about this first one, the tests for the WISC-V.

Are there others that you can refer me to that form part of the basis for that opinion?

A. So, I looked at frontal and executive functioning -- functioning in detail and there were impaired scores in some of those tests as well. If you look at TMT, that test that we've discussed a few times now, this test was also, again, impaired in D[redacted] -- in D[redacted].

The difference between her impairment and the impairment to the other children, there are two noticeable differences. So this is a test that -- that the A component of this test is a visual scanning and rapid sequencing test. It is very easy for children of this age, and so they complete it very, very quickly. So although the -- the raw score of 37 seconds is fairly similar to what was seen in some of the younger children, it is much worse at D[redacted] age. It was almost three standard deviations below the mean, which is -- is a -- a very unlikely score in the general population.

The B index, which we haven't discussed in this deposition, the difference between A and B is

that the B component involves something that psychologists call dual tasking or set shifting. It involves essentially requiring children to maintain two flows of information at the same time and switch back and forth between them in order to correctly solve the problem, and that was also impaired. That's that Z score of minus 1.7.

In addition to that, the other area where the impairment was seen was the Tower of London, which is further down the page, TOL-DX. And there the -- this is a test of multistep problem solving. So what a child has to do is solve a problem that gets increasingly more difficult, that requires them to think multiple steps in advance. So if they don't think multiple steps in advance, they do something that looks like it might solve the problem but it actually makes the situation worse, if you can imagine that, and that's the kind of test that this is.

And I am -- I -- I have this up on my computer as we did yesterday, but on the previous page, Page 6, I describe this in text, but what happened is that when these problems were relatively easy, and easy in this case was five steps, she did very well. She became more inefficient and then she

also broke the test rules later in the test when it became more challenging. That's that RVS score of 72 which is psychometrically impaired. It was actually, I think, I'd have to look at the test form, but I think it was actually only one error, but those errors are uncommon enough in children this age, especially once they've learned the rules and made it halfway through the test that I consider that remarkable and it -- it is psychometrically impaired as well.

So, to summarize, she showed problems with visual reasoning as well as problems with rapid information processing, divided attention, or set shifting, and -- and also with flexibility in problem solving.

Q. Show me where that is, please.

A. The flexibility and problem solving is a -- the Tower of London.

Q. Oh, okay.

A. Sorry. I -- I think I used a different term, but that -- that's a general kind of category that we would put this in.

Q. I don't see that on the report in scores on this summary sheet here.

Is that -- am I missing that?

A. I'm sorry. The -- the -- the -- this Tower of London, TOL-DX is the one that you just circled with your cursor.

Q. Yeah, but you said -- I don't see the reference to the problem solving issues that you just described.

What -- which of these numerical scores represent that?

A. RVS of 72, that's the second row, first column.

Q. All right. Thank you.

Okay. Continue on. Is there any other evidence in the testing as to her -- relevant to her diagnosis that you made?

A. Those were the -- excuse me -- only cognitive deficits. I -- I rated -- I considered the Vineland Adaptive Behavior Scale to be normal in her case, and then, again, there is a description of the BASC in the report, and then I will give you the page number for the detailed score sheet for that, and that is -- oops -- 98 in this case.

Q. Yep.

A. And so here the Atypicality Index is one that we haven't talked about before. That is the one

that is in the dark gray area. It is at the 95 percentile, meaning that only one out of 20 children this age have as many behaviors in this area. Atypical behaviors are strange -- essentially, I apologize for the use of non very -- not very psychological language, but they are strange or weird behaviors, children who do things that seem odd or off to their parents or other people. That one was the most elevated in A[redacted] case.

And then there were some milder elevations with a lack of social el -- engagement, attention problems and adaptability.

Q. What were the weird behaviors that the parents described? Would we have to look at the -- their -- their answers to that?

A. One moment, please.

MR. ROGERS: Hey, Corey, if you wouldn't mind, can you go on mute. I think I'm hearing some fuzziness sound coming from your phone.

MR. STERN: I'm on mute.

MR. ROGERS: Oh, okay.

THE WITNESS: I'm not sure who that is. I hear it also.

MR. ROGERS: Yeah.

THE WITNESS: I don't think it is me because it's quiet here.

MR. ROGERS: Yeah, my -- it's quiet here too.

BY THE WITNESS:

A. The -- the items with my concern that -- that I do what I am supposed to to protect test security, meaning that we generally -- these kinds of tests work better if the general public don't know about the content of these, but those items are in the documents that we have provided to you and they are on Page 117 and 118.

And so in her case, these were things like acting confuse -- confused, having staring spells, and then there was a wide variety of things like saying things that don't make any sense or being unaware of others that were marked as sometimes --

It's a -- it's up from here. It is on a prior page.

BY MR. ROGERS:

Q. Oh, I see. Okay.

A. It is right there, yeah.

Q. Yeah.

A. I also describe this in the interview, sorry to make you flip around through a very large

document, but on Page 4 of the report, which is also Page 4 of the PDF file, I --

Q. Can I -- I'm sorry --

A. I noted in the --

Q. Sorry, Doctor. Just let me stop you for now. I'm still looking at this one here. Give -- bear with me a minute.

A. Please.

Q. So the -- the -- I asked you the question, you know, what -- what did the parents describe as her behavior that was weird, as you -- the word you used, and then so it's under this Atypicality section on the bottom of Page 117 and then down to 171, right? Okay.

A. Down to -- yeah, yes, correct.

Q. Yeah, the next page?

A. Those two pages.

Q. Item -- Item 171.

And, you know, you made a comment about not disclosing -- disclosing these -- this information to the general public. I -- I hope you've been informed or that you're -- you're aware, I didn't mark this court order, but there is a court order in the case that called for production of this material that allowed you to produce it after consultation with the

judge and the attorneys, it was an agreed upon order, that the information is confidential under the court's protective order and it's to be used only by the neuropsychologist consultants in the case or other medical professionals, as well as the lawyers would have to have access to it for, you know, use in the litigation and the evaluation.

So, something to the effect you said, you know, they are not -- it is not supposed to go to the general public, it isn't, you know. You understand that, right?

A. That's the reason I produced the information to you, yes.

Q. Exactly, okay. So you were just explaining something about, you know, this information generally as to why it's not disclosed, but you understand it's not being disclosed in this case except for as purposes that are allowed under the court order.

Okay. So, that -- did -- did you want to direct me to, what was it, Page 4 of your report for her to describe this?

A. Yes, please.

Q. Yeah.

A. So, the -- the correlating things that the parents reported on Page 4 are primarily in the paragraph that says: "They started noticing," it's the bottom paragraph on the screen, where you are currently.

There they noted that she is foggy, she will have unusual lack of detail in things that she explains. Those are the things that she was noted to have that fit with Atap -- Atypicality Index that came up in the interview. They did also mention things that fit with some of the other more mildly elevated index -- indices, and so in the next paragraph D[redacted] mentioned that she -- she said, I don't let people get too close to me. For what it's worth in my experience, that's an unusual statement by an 11-year-old.

Q. Okay.

A. But it correlates with the Social Withdrawal Scale on the BASC.

Q. Okay. Thank you.

Anything else on that?

A. I don't think so.

Q. Does that complete a description of the evidence that you found in your tests and evaluations

that form the basis for your diagnosis of her?

A. Yes, it does.

Q. I want to turn to the Recommendation section then, like we did with the others.

I was curious, too, why did you call them recommendations versus, you know, prognosis? Some of them seem to be, you know, sort of prognosis type things as opposed to recommendations? Why do you entitle this section Recommendations?

A. I could -- I think that's good advice. Perhaps I will do that in the future.

Typically the -- in my clinical reports, that's what this section is called. So like in the template documents that I use, the -- when I change it in a medical-legal kind of setting, typically I change it to questions for the examiner.

If I was given explicit questions to answer in a -- oftentimes in these kind of evaluations there is a list of questions that an attorney provides and I put them in the report verbatim and then I answer them one by one. Because that wasn't done in this case, I used what I usually use in my clinical reports.

Q. Let's see.

For the first recommendation here, you say: "There is not a clear basis for her to need a current individualized education plan, but she should receive accommodations to complete testing in a private environment as part of a 504 plan."

Do you know if that -- or up until the point in time that you examined her, she didn't have an IEP and she didn't have that component of a 504 plan as far as you knew or know?

A. I -- let me review my -- my notes, my report.

I am not aware that she has had either an IEP or a 504 plan.

Q. So in terms of accommodations for testing in a private environment, what does that mean? Does that mean, you know, testing, if she does academic tests in school, to have her be separate from others when she does that?

Is that what that means?

A. Correct. And so typically this -- the students with attention problems were -- the kinds of -- the kinds of issues that I described in the cognitive profile are offered the opportunity to take tests in something like a resource room or a library

that's a low stimulation environment that doesn't have as many distractions.

Q. Okay. And then turning to the second paragraph, this -- this one, you know, the language that you use here, I think you would admit, is a little bit different than the sections that address these same subject matters in the -- in the prior children because you talk about, you know, her intellectual ability and the -- her FSIQ, but then you say on the other hand it doesn't match exactly ADHD, but they -- you talk about the ADHD statistics that we talked about in that Fredriksen paper.

So, when you come to the conclusion here where you say that there is an increasing risk of her dropping out of high school to 15 percent from 5 percent versus the general population.

Explain to me how it is that you come to that conclusion for her.

A. So, in her case that is my estimation based on my opinion that the -- although I did not diagnose ADHD, that the -- the cognitive symptoms are substantially similar to ADHD and so I believe that the rate would be similar to the -- the threefold odds ratio that we discussed in the ADHD context yesterday.

That's from the reference that we discussed yesterday.

Q. Right.

A. That's provided here.

Q. So -- yes. Thank you.

So the -- the Fredriksen, Dahl paper, that is the only scientific literature or paper that you have cited to or referenced that provides the basis for your opinion about this increased risk that she would drop out of high school, is that correct?

A. That's correct.

Q. Okay. Then we -- you go on to say: "This is true even though, in a clinical sense, symptoms are 'mild.'"

Why did you add that last sentence in there, what did you mean by that?

A. Well, I think that yesterday we discussed this issue that -- that clinicians use terms like "mild." Typically we use these terms relative to the disorder itself, and so sometimes the term "mild," you know, in my experience is misunderstood by people outside of the profession.

If I use an example that is maybe more accessible, unrelated to these children, clinicians have a diag -- have a diagnostic criteria and use the

term "mild" to refer to mild Alzheimer's disease, but nobody wants to have Alzheimer's disease and even mild Alzheimer's disease is very disabling.

And so my point is that although these -- these cognitive symptoms are mild, they are significant in a real world sense. That -- that's all I mean by that.

Q. Okay.

A. The other difference -- the other thing that you had mentioned earlier and -- and that is in my report is that differentiates D[redacted] situation from the other children is that she had this FRI, Fluid Reasoning Index on the WISC that was in the -- that was impaired, the score was 74 or more than about 1-1/2 standard deviations below average.

The reason I mention that is because that was -- in these four bellwethers, I believe this is the only time when that happened. The significance of that is that, based on my clinical experience, IQ scores -- well, let me back up a step.

IQ scores have a long history of predictive validity in a variety of settings, although I think that they are commonly misunderstood by the general public. And so I'm saying this not so much

for your benefit, but anybody who reads this deposition, because I think that you probably already know these things.

So people often in the general public will talk about very high IQ scores, like my IQ is 186 or a hundred -- 204. When you actually look at these tests, they often don't even go that high. It's not possible on this particular test to have an IQ of 200.

They also misunderstand and say that, you know, if -- it's common in -- in general pol -- parlance to make the assumption that people who have advanced degrees, like yourself or me, have very high IQs. We might and some of us certainly do, but the idea that every doctor has an IQ of 130, you know, or every attorney has an IQ of 130 is -- is not likely to be true.

With that being said, in general, if the Fluid Reasoning Index is an index of general thinking abilities, that score is lower in D[redacted] case than IQ scores that are generally considered competitive in collegiate settings. And so that is something that is unique for her that didn't come up in the other three bellwethers that we've been discussing because I didn't have that kind of finding.

Q. So with respect to the assessment that you have about collegiate success for D[redacted], you have an estimate of a likely 25 to 50 percent chance of her dropping out in secondary education.

Is that percentage estimate also based on the -- as it was with the others, based on your anecdotal experience with patients that you've treated?

A. Yes, it is.

Q. And just to confirm then, there is no other scientific literature or studies or data that you can point to that would quantify that for persons who have the deficits that D[redacted] has?

A. I am not aware of any.

Q. Is that also true -- would that be the same answer with respect to your statements here that this results in an overall increased risk that D[redacted] will work below her potential, that she would not succeed in a skilled vocation, and would be sort of relegated to simple unskilled work?

A. Correct.

Q. With respect to these deficits that you've identified for D[redacted] W[redacted], are their treatment or coping mechanisms or -- or skills, skill-type training

that could help to assist her in overcoming these deficits, like we talked about with the other children?

A. In D[redacted] case, because she shows a mixture of some of these nonverbal learning problems and issues that look a little bit like ADHD but not very clearly like ADHD, but that are psycho -- that do correlate with psychometric impairments and attention functions, it would be a mixture of the two.

The -- I'm sorry. It would be a mixture of some of the things that we talked about earlier. For her visual reasoning, increased exposure to art, like drawing or painting would be very helpful, occupational therapy might also be helpful. And then for her attention problems -- I'm sorry. And for -- for her visual problems, so far I don't see a basis for her needing an IEP on that basis, and I'm not sure that she would, but the accommodative approaches like the 504 plan would probably be sufficient to mitigate that.

With respect to her attention, it would be reasonable for her to see a psychiatrist. It's possible that medications would -- would be beneficial for that as well.

Q. Would you expect those types of treatments or accommodations that -- or skill set learning that you describe to be successful?

A. I -- it depends, I think, on how you define successful. What I could say is that when it comes to IQ scores, there is no good evidence that IQ scores can be -- that -- that the -- let me -- let me rephrase that.

There is no good evidence that the underlying cognitive abilities that I -- IQ scores measure can be meaningfully changed by interventions, and so that FRI, for instance, being in an impaired score would be unlikely to change from interventions, but it may be that -- that through a mixture of learning, learning techniques and compensatory tools, and possibly emphasizing work that can be done in a way that does not highly leverage those kinds of skills, that -- that somebody like D[redacted] could mitigate.

Q. All right. Since you are of the opinion that these deficits that she has experienced were caused by developmental lead exposure, if going forward she doesn't have any additional exposure to lead, would these symptoms and deficits diminish over

time?

A. In general my answer to that question is the same as before. The only difference I would offer is, as you noted, DPPI is one of the oldest bellwethers -- I think she is the oldest of these four bellwethers. I think that, if I remember correctly, she is also either the oldest or close to the oldest of the 14 children that I evaluated.

The only caveat I would really offer is that in DPPI case I am not the expert on bone lead measurement and -- and I -- I believe that there may be others who will testify in more detail about that, but DPPI was 11 already, almost 12 when she had her bone lead measurement. And in general what I would say is that the -- the amelioration possibility that arises from the cessation of lead exposure is going to be higher when the lead exposure period is briefer and when there is more time during the developmental period to recover.

Q. What is that based on? Where do you derive that information?

A. That's based on my general understanding of brain development.

Q. Okay. Can you see what's up on the screen

now? This is -- this is the summary sheet, initial summary sheet page for her testing, DPPI WPPI, and I -- can you see that all right?

A. I can, yes.

Q. Each of these sheets, and I didn't ask you about all of them, but I -- I think I asked you about one, and I just want to clarify here, where it says: "Hours of neuro" -- "neuropsychologist face-to-face," in this case you have it as 9 to 12:15, does that include the time for the interviews with the parents and the testing, or parent?

A. I believe in this case that that's the testing.

Q. All right. Is -- would that be true with each of them, that is to say, this period of time that you recorded there would only be the actual face-to-face with you when the testing was being done?

A. I believe that's correct. Generally speaking the testing component for each of these children took about three hours.

Q. All right. And what -- what would you say the approximated time was that you spent with the parents doing the interviews and getting the history and that sort of thing?

A. I believe in general most of the interviews were about an hour long.

Q. And then you say over here: "Hours interpretation," I can't rean your -- read your handwriting here.

What does that say?

A. I -- I may not have even finished writing that. These are just notes that I was taking during the evaluation, but it says that I spent an hour reviewing records before I saw D[redacted].

Q. Well, what -- read to me what these notes -- what the words are or the numbers that you have written here. I can't make them out.

A. It says: "Plus one pre, plus one lunch hour."

Q. Okay. So for these sections of the reports under "hours interpretation," your notations there would mean the amount of time that you spent reviewing the records and then, either before the interview or after, and then additional time, if you did spend it, on interpretation of the test results, is that right?

A. I apologize. It's -- so this is not a complete accounting of the time that I spent on this

report. I -- I did not finish writing this report over lunch after I saw her, but -- but these are times that I spent interpreting. So what this means in this case is that I spent the lunch hour scoring tests.

Q. Right. Okay. I get it. So you had told me that before, if -- if there is any time in these summary sheets under "hours of interpretation," that does not include the time that you spent actually writing up the reports.

You did that later, right?

A. Correct.

Q. Okay.

I want to ask you some questions about -- and I think this will now be a paper that we're going to mark as Exhibit 21, just to make sure.

MR. ROGERS: Is that -- are we right on that, Juliana, this would be 21?

THE COURT REPORTER: Yes.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 21, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. Do you recognize this Ko -- paper, Doctor,

from the lead author Karin Koller, I believe it's mentioned or listed in the Bibliography of references that you prepared for your report, is that right?

A. Yes, I -- I believe that I have read this paper.

Q. So you're -- you're fam --

A. I think this is one that I cited.

Q. Yeah. I don't recall that you -- correct me if I'm wrong -- I don't recall that you referred to or cited this paper for any specific parts of your report or any of your diagnoses or conclusions.

Am I right on that?

A. I believe that -- it may be that I cited it explicitly in another one of the -- the reports from the 14 children that I saw.

Q. I see.

With respect to these bellwether plaintiffs, nevertheless, this was one of the papers that for these four you included in your overall Bibliography, right?

A. That's correct.

Q. Okay. And this -- this study says in the abstract, I guess that's what you would call this.

What would you call this first section

here highlighted in blue? Is that the abstract or basically the summary of the article?

A. That's the abstract, you are correct.

Q. Okay. Thank you.

It says here -- and this is a paper from 2002, I believe -- I'm sorry, 2004.

And it says: "In the last decade children's blood lead levels have fallen significantly in a number of countries, and current mean levels in developed countries are in the region of 3 micrograms per deciliter."

Do you have any reason to disagree with the author's statement as to the current mean levels in developed countries for blood lead levels?

A. If I recall correctly, you showed me CDC data -- you showed me CDC data yesterday and when you were asking me if I had considered normative bases for lead levels, and the data that I recall you showing me was more like 0.6 micrograms per deciliter as a mean level.

Q. Right. But those were in late -- right, but as you recall, those were in later years. This -- this study is reporting on, you know, data prior to 2004. That information that I showed you yesterday

was based upon data sampling that began in 2011 through 2016. So what I'm asking you is that do you have any reason to disagree with the author's statements about the mean blood lead levels that they are reporting as of 2004?

A. No.

Q. Then the authors go on to state in the abstract here:

"However, from a public health perspective, exposure to lead should be seen within the many other risk factors impacting on normal childhood development, in particular the influence of the learning environment itself. Current lead exposure accounts for a very small amount of variance in cognitive ability (1 to 4%), whereas social and parenting factors account for 40% or more."

You're familiar with the author's conclusion as it's expressed here?

A. Yes.

Q. Do you have any reason to disagree with it?

A. In the context that the authors are speaking in, no.

Q. What do you mean by that, what context?

A. This is a cross-sectional -- these -- these -- this is based on cross-sectional data about large populations in which there is much more variability in factors like social and parenting factors than there is in factors like lead.

So, the authors, to the best of my understanding -- and I didn't write this paper -- but the authors, to the best of my understanding, are saying that when you look at the general population, lead is not a driving factor of cognition in the general population of children who don't have known lead exposures. But that's not the population that we are talking about here.

Q. What is your basis for saying that this study involves the general population and not children who have had lead exposure?

A. So, I would be happy to run through this article in more detail if you want me to take a break to do that, but it looks like they are using NHANES data again.

Q. Well, I'm not following, because if -- if, in fact, as we looked at the statistics yesterday, the blood lead levels for these four bellwether plaintiffs are within the range, the measured levels are within

the range of what has been reported as average, that would mean they are not exposed to lead more than, you know, the average across the nation, right?

A. That -- that's your statement, not mine.

Q. Is it correct?

A. Can you say it again, please?

Q. Yeah. Remember the data that we looked at yesterday with the mean blood lead levels for a period of time for these in this age group of children, 2011 through 2016, right, we just talked about that. And if the -- if -- if -- if it's true that the average blood lead levels reported in that document that I showed you from NHANES data from the CDC, if the averages for these children, these four bellwethers are within that range of average, then there -- it doesn't indicate that they have been exposed to lead more than the average of kids across the country, right?

A. If the -- if -- if a child has a lead val -- has lead values that are only within the average range that are reported in the NHANES data, then I would agree that that child has a level of lead exposure that is comparable to the general population based on that data assuming that there is no other

source of information that contradicts it.

Q. Okay. So, what is your -- getting back to the point about this article, I think I would like you to take the time. Why don't we -- we are very -- we are on -- we are doing very well on timing, so I would estimate that I probably only have about another half hour left, so here is what I suggest.

Let's take a -- do you think maybe ten minutes would be enough for you to just peruse this article, Doctor, and -- and make yourself familiar with it so that you can answer that question that I asked you previously, or how much time would you like, you tell me?

A. I -- I think ten minutes is probably reasonable. Can you please repeat the question?

Q. I hope so.

You -- your statement, I think, was something to the effect of that your understanding of what the authors were reporting on was an analysis of a -- of the general population, including a cohort which had children that were not exposed to high levels of lead or lead exposure, something to that effect, and I think you said -- I said what's the basis for that or you said something about the

context, right, and I asked you, Okay, what's your basis for saying that, and you said, I'd like to have more time to peruse the article. So I -- I think that's the thrust of the question.

A. Okay.

Q. Okay. So I -- I'm looking at --

A. So --

Q. I'm looking at the basis for your saying that, you know, what is the context in which the authors are reporting these findings with respect to, you know, the lead exposure for the children involved in the -- in the survey or the study that they did.

So let's take -- you know what, we're -- we have plenty of time. It is almost 11:30. Let's take 15 minutes. I'll give you the time to do that. And then I'll -- I'll be able to finish up I think my questioning by, if that's 11:45, I should be done by 12:15 and then I can turn it over to the other defendants and see how much they have, okay?

A. All right. Thank you.

THE VIDEOGRAPHER: Off the record, 11:28 a.m.

(WHEREUPON, a recess was had from 11:28 to 11:47 a.m.)

THE VIDEOGRAPHER: Back on the record,

11:47 a.m.

BY MR. ROGERS:

Q. Okay. Doctor, we've taken a 15-minute break, and to turn to the subject, I -- I do -- I do still have up on the screen, hopefully, this paper we are referring to, and I think the -- the question before you was what -- what you wanted to do to put it in context based on the findings that I reported from the abstract. So go ahead, please.

A. So I just wanted to state for the record that I -- I didn't write this paper and I'm not an expert on this paper and you may have to direct some of the questions that you have to the author of the actual paper.

With respect to this 1 to 4 percent statement that you had previously discussed and highlighted, I am not able to determine what the basis for that statement is. The only place that I see it made -- referenced, again, in the article is in the very last sentence where it is a reference to another paper, and so I'm not sure -- I'm not sure what that statement -- what the basis for making that statement is by the authors.

Q. Why did you include this -- oh, and just

for the record, so I went to that last page of the article and it -- it says there, as is highlighted: "Current lead exposure accounts," et cetera, et cetera, and then it cites to the Weiss paper from 2007, right -- I'm sorry -- 2000.

Is that what you meant?

A. Yes, correct.

Q. Okay. So why did you include this paper in your Bibliography?

A. I don't generally review journal articles with the expectation that I agree with every sentence in them or understand the basis for every sentence in them, but this paper reviewed lead exposure in children, it discussed a number of studies that had attempted to determine exposure, it reviewed at least some findings that children who had lead exposures below the 10 micrograms per deciliter level that is typically used to define lead poisoning had decrements in intellectual funding.

Q. Hmm. Okay.

Have you ever seen this data, that is, that: "Current lead exposure accounts for a very small amount of variance in cognitive ability (1 to 4%), whereas social and parenting factors account for

40% or more," have you ever seen that cited by or referenced by any other authors in your research on this case?

A. I haven't seen that specific statistic cited elsewhere.

Q. Have you ever reviewed any studies or literature from the CDC in which this statement and these findings are reported and repeated?

A. The -- the highlighted statement?

Q. Yep, the one I just read, yeah.

A. I am not aware -- I am not personally aware of another source where that statement is made. I'm -- I'm -- CDC or otherwise.

Q. Okay.

A. If you'd like to show me, I'm happy to look at it.

Q. No. We can move on at this point.

I'm going to show you another paper. That one was 21. I'm going to show you a paper now that will be marked as Exhibit 22.

(WHEREUPON, a certain document was marked Mira Krishnan, Ph.D. Deposition Exhibit No. 22, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. And it's a paper by several authors, but it's the 2019 Roy and Edwards paper.

Do you know who Dr. -- do you see his -- I'm -- my cur -- where my cursor is here, do you know who Dr. Marc Edwards is?

A. That name is familiar. I believe that I've met Dr. Edwards.

Q. Did -- have you had any conversations with Dr. Edwards about the work that he did analyzing the water in Flint and the water lead levels and so forth, the work that he did?

A. I -- I have not. If I had met him, it would have been before this crisis.

Q. Okay. Did you --

A. I am not sure if I've met him. The name sounds familiar. There -- but it may also be that there is a different Marc Edwards.

Q. Well, I'm referring -- this Marc Edwards is the Virginia Tech professor who, you know, came out and did all of -- all of the water sampling and the water lead testing for the people of Flint, you know, after the water crisis had occurred.

So is that the person that you believe you

met?

A. I -- I think, actually, I -- I met a different Marc Edwards.

Q. Oh, okay. Well, so be it.

A. My apologies.

Q. So -- no, no, that's all right.

So, Dr. Edwards has given a deposition in the case, and just to confirm, this was, I don't know, maybe a month ago, a few weeks ago.

You have not reviewed Dr. Edwards' deposition testimony in the case, is that right?

A. That's correct.

Q. In fact, other than the depositions of the parent plaintiff representatives, you haven't reviewed any depositions in the case, right?

A. I believe that's correct. I believe all of the depositions I reviewed were of parents.

Q. So Dr. Edwards is reporting in this paper, and he also testified about it in his deposition, that based on his analysis and the highlighted section that I have -- have presented to you here, he says:

"Although total biosolids lead increased just 14% during the 18 months of the FWC," meaning the Flint water crisis, "versus the comparable time

pre-FWC, 76 percent of that increase occurred in July through September of 2014."

Do you have any basis or reason to disagree with that statement by Dr. Edwards?

A. I -- I am unable to evaluate that critically.

Q. Is that because you lack the expertise in that particular field to do so?

A. Yes, I don't know very much about biosolid lead --

Q. Okay.

A. -- increments.

Q. And then he said -- and then he says:

"In" -- "And the corresponding percentage of Flint children under 6 years with elevated blood lead," and he describes that as greater than or equal to 5 micrograms per deciliter, "doubling from 3.45% to 6.61% in those same three months versus 2013," and then he goes on to say here, "was not statistically higher during the remaining months of the FWC compared to pre-FWC or post-FWC."

Do you see that, up through here?

A. I do.

Q. Do you have any reason to disagree with

that statement?

A. I -- I don't. But, again, I didn't write this paper and -- and I am -- am just seeing it now.

Q. Okay. I won't go into the rest of the paper then, but I can -- I'll just try to summarize it and report to you.

Dr. Edwards reported that there was a significant spike in lead levels in the biosolids that he believes indicates a significant spike in the lead content of the water system during 2011.

Are you familiar with that finding that he has made at all?

A. I am not.

Q. Have you ever seen any scientific papers or studies or other references to that that there was a spike in the lead content of the Flint water in 2011 before the switchover to the Flint River?

A. I -- I am not familiar with that, no.

Q. Okay.

MR. ROGERS: Then the last -- this one we marked as Exhibit -- is this -- would this be 23, Juliana?

THE COURT REPORTER: Yes (sic).

MR. ROGERS: Thank you very much.

(WHEREUPON, a certain document was

marked Mira Krishnan, Ph.D. Deposition Exhibit No. 23, for identification, as of 10/06/2020.)

BY MR. ROGERS:

Q. I want to get to your Notice of Deposition, which would be No. 20 -- Exhibit No. 24 (sic).

So I'm going to ask you some questions, Dr. Krishnan, just to make sure that you don't have anything in your files that have -- hasn't been described or produced yet. This was a -- if you can see it on the screen, it's what's called the deposition notice, it sets forth the date when you are going to be deposed, and it also has a document request which is called a Schedule A which I'll show it to you now.

I just want to go through --

A. You haven't shared your screen yet, sir.

Q. Thank you. My bad.

There it is. Can you see it now?

A. Yes.

Q. Okay. So I'll just size it down a little bit. So as I was saying, this is a Schedule A document request. There is language in here about

the -- producing the file material seven days before your deposition.

But in any event, have you now summarized for me and/or produced your complete expert file in the cases involving the bellwether plaintiffs, TPPI, VPPI, WPPI and -- and SPPI?

A. To the best of my knowledge, yes.

Q. And you've produced -- Paragraph 2, asks for the complete time and billing records, you've provided me with two billing invoices and that's all you have, right?

A. So I -- I provided -- I provided invoices to the attorneys, and so I am -- the attorneys on the other side, and so I am not completely sure if there may have been a -- something missing there.

There is an invoice -- sorry. I -- I -- I didn't submit an invoice that covered the usage of the retainer for Napoli law until September. That invoice I provided to -- I had provided it to Napoli. If you only have the one from Levy Konigsberg, then I believe the Napoli attorneys are in possession of that and they can provide that to you.

Q. Okay. I think, though, that for -- for TPPI, VPPI, WPPI and SPPI those are all

Corey Stern's clients who would be the Levy Konigsberg firm, but we can look into that. So thank you for telling me.

You -- you have a separate invoice that you issued to the Napoli firm for those other bellwether plaintiffs?

A. Correct.

Q. But with respect to any work that you've done on TPPI, VPPI [redacted], WPPI and SPPI [redacted], those bellwether plaintiffs, you don't have any other invoices because the reports that you wrote were work that you did that was included within the billing or invoicing that you did originally for the case, right, for these cases?

A. That's correct.

Q. We have your most current CV, you've told me that you don't have a testimony list.

Is it correct that you don't have any witness statements, Paragraph 5 here asks for witness statements obtained by you or reviewed by you in connection with this case, apart from what's described in your reports?

A. That's correct.

Q. The only thing by way of deposition

transcripts that you have, Paragraph 6, is the transcripts -- did you get the exhibits along with the deposition transcripts for the parent representatives of these plaintiffs?

A. I -- I don't think I did.

Q. Did -- there is a typo in this one, Paragraph 7, but it says: "All facts or data that you considered in forming your opinions, including, but not limited to." So let's leave out the "including but not limited to" because there is nothing after that.

Did you -- have you provided all of the facts and data that you considered in forming the opinions that you have in the case concerning these four bellwether plaintiffs?

A. I believe I have.

Q. The Federal Rules of Civil Procedure call for experts to provide information concerning any assumptions that were provided to experts, and in this case provided to you and relied upon you in forming your opinions. I just want to make sure we cover that.

Did you receive any facts that you assumed to be true from the plaintiffs' lawyers that you

relied upon in forming your opinions that you haven't already told us about?

A. Forgive me for being a little new to these rules. Can you give me an example of something that would be -- that would fall in that category?

Q. Sure. I am in an excellent position now because for the past two days you have been telling me how any neuropsychologist would know this, and I'm pleased to be able to explain something to you concerning the law.

So, that would --

A. The tables have certainly turned on me at this point.

Q. Yep.

So, the -- an example would be if a lawyer in an e-mail or a letter, or even in a conversation said to you, Dr. Krishnan, for purposes of the opinions that you are going to come up with or generate in the case, I want you to assume that there will be evidence that the lead content in the water of these children was X, and I'm not going to give you any documents or anything that support that, but I'm just going to tell you that. I want you to assume that and have your opinions be based in part on that.

That would be an example. So they didn't provide you with actual data of test reports or something, but they said I want you to assume that.

Is -- is it correct that no such assumptions -- you have -- you have not asked or been provided with any assumptions on certain facts that you relied upon in forming any of your opinions in the case?

A. I don't believe that I have.

Q. Have you engaged in any correspondence, whether e-mail or letters, between you and other consultants retained for the plaintiffs in the case?

A. To the best of my knowledge, only the ones that I had provided to the law firm to -- to Patrick Lanciotti in this matter.

Q. I think you might have misunderstood. The -- the -- let me explain. It's not clear.

Have you corresponded with any other expert consultants retained by the plaintiffs in the case, not with the lawyers but with other expert consultants?

A. I provided Pat -- Mr. Lanciotti copies of e-mails exchanged between myself and Dr. William Bithoney.

Q. I see. Okay. Thank you.

Is there any other such correspondence with any experts in the case?

A. I'm not aware of any.

Q. Okay. So whatever correspondence by way of e-mail that you had with Dr. Bithoney, you still retain those e-mails and you provided them to Mr. Lanciotti, is that right?

A. That's correct.

Q. What subject -- without telling me what's in the e-mails, what are the basic subject matters of the correspondence, e-mail correspondence between you and Dr. Bithoney?

A. Most of the e-mails asked me when I would have reports ready for him to review, and then there were also, I believe, there was a question about the date on which I -- the date range in which I had completed the evaluations. If I remember correctly, he wanted to know if I had seen the children in May or June.

Q. Okay. Anything else that you can remember?

A. No. Oh, I think --

Q. Did --

A. -- I think he also asked me for a clarification about a demographic factor for one of the children. I'm sorry.

Q. Was it one of these four?

A. I -- I would have to review those e-mails, but I -- I think at one point he asked me if one of the children was a boy or a girl.

Q. Okay. Thanks.

So with respect -- did -- did you have any communications with Dr. Bithoney that were not e-mails, that is, telephone conversations, Zoom conferences or anything like that?

A. He -- if I -- to the best of my memory, he called me by telephone also on the topic of when I would have reports available to review.

Q. He really wanted those reports, huh?

A. It is a somewhat long story, but as you may already know, I -- my involvement in the case began at a relatively late date and so there were significant time pressures at that time.

Q. Well, I certainly understand the sequencing, you know, that's common, right, where experts sometimes need information and reports from other experts, so.

Okay. That being said, I want to make sure, you've never -- you -- before you wrote your reports, did you -- were you provided with any reports or information from other consulting experts before you wrote -- with respect to these four plaintiffs before you wrote -- you wrote your reports for them?

A. I would like to ask a question of the attorneys from -- from Napoli and Levy Konigsberg before I answer that, if that's okay?

Q. Sure.

A. May we go off the record?

Q. Sure.

THE VIDEOGRAPHER: Going off the record, 12:06 p.m.

(WHEREUPON, a recess was had from 12:06 to 12:15 p.m.)

THE VIDEOGRAPHER: Back on record, 12:15 p.m.

MR. STERN: This is Corey Stern. Mr. Rogers for VNA and I just had an off-the-record conversation.

I wanted to note for the record that prior to Dr. Krishnan agreeing to serve as an expert for the four bellwether plaintiffs who are the subject of this deposition, plaintiffs counsel had retained another expert for the same purpose. Because of the COVID-19

pandemic, roughly two to three weeks before that expert was scheduled to travel to Flint, Michigan to evaluate the children who are subject of this -- the subjects of this deposition, that expert informed my law firm that he was unable to travel or participate in the litigation in the way in which we had requested his participation, meaning to physically evaluate and meet with the children and their families.

At that point in time we -- or -- or somewhere around that point in time we requested an extension of time from the Court with regard to provision of expert reports and we hired Dr. Krishnan to perform the same evaluations and provide her expertise with regard to those evaluations.

Any -- there may have been documents or communications that were between my office and the original expert that was retained which we may have forwarded to Dr. Krishnan before she got started on her in-person evaluations with the families of -- and -- and the actual plaintiffs for our cases.

The -- the original expert did not ever evaluate the children. He was unable to perform the tasks that we had asked because of the COVID-19 pandemic and ultimately we are here today for the

deposition of the expert that was retained. There was no reason for that expert to cease working with my firm other than the pandemic. It is an expert that I've worked with for close to a decade in lead poisoning cases who I highly respect and it was regrettable that he was unable to perform the tasks that we had hired him to perform.

Notwithstanding that, we are extremely happy with the work that Dr. Krishnan has done on behalf of these individual plaintiffs and we are excited, you know, to have her as part of our -- our expert team.

MR. ROGERS: Okay. Thanks, Corey.

BY MR. ROGERS:

Q. So, Dr. Krishnan, is it -- is what Mr. Stern said accurate in the sense that some information was provided by him to you about some information or materials that the previous consulting expert had authored or had input in?

A. Yes, it is.

Q. And do you have those materials sort of segregated out or stored or -- or in your files or in your possession in some form?

A. I haven't checked during this break, but

if they were provided to me, I believe I still have them.

Q. Okay. I'd just ask you to maintain those, please, and we'll have to consider what, if anything, to do about this at another time.

I just want to clarify, the -- the materials that you did receive, it wasn't a report or evaluation or data of any type that that other consulting expert provided on the plaintiffs, was it?

A. To the best of my knowledge, it was an un-finalized document and I essentially was not able to -- I did not use it to draw any con -- conclusions, I did not use it to make any assumptions, and I started over and completed completely independent evaluations. And the reason I don't mention it in my reports as well is because I didn't reference it.

Q. Okay. So I'll just ask you to hold on to that and segregate out whatever those materials are, and, you know, so that we have -- we know what they are for a future time. And with that, I just want to finish up the questioning on this document that I hope is still on the screen.

Is this the -- the -- well, let's make sure there is nothing else. So we were on Paragraph 9

and I was asking about, and this is what caused -- prompted the break for the separate communications with the counsel there, correspondence between you and other consultants retained for the plaintiffs.

Apart from what you just told us about this one consulting expert, did you have any correspondence or communications or receive any information from any other consultants for the four bellwether plaintiffs?

A. I am not aware of having received any other correspondence or communication.

Q. Okay. And then the last paragraph asks for, this is actually language, I think, right from the court order that we worked out on this, and it says:

"The complete and unredacted raw data, test forms, test protocols, test reports, computer printouts and examinee and informant response sheets for the tests and evaluations administered concerning the bellwether plaintiffs TPPI, VPPI [redacted], WPPI and SPPI [redacted]."

And have you produced all of that information to us and we've marked those as exhibits during the deposition?

A. To the best of my knowledge, yes.

MR. ROGERS: Okay. That -- those are all of the questions that I have for you. Thank you very much for your cooperation and patience over the last day and a half, and I'm wondering if the other defense counsel have questions and maybe if we could just go ahead and finish at this time.

MR. GAMBLE: This is Travis Gamble on behalf of the LAN defendants. In light of your completely thorough examination of the witness, LAN has no additional questions for Dr. Krishnan at this time.

MR. ROGERS: Okay. Thanks, Travis.

I -- I noted that Bill Kliffel was on the Zoom conference yesterday. I don't know if he is on today.

Is there -- are there any other defense counsel, City of Flint or otherwise, who -- who want to ask questions?

MR. KLIFFEL: Hey, David, can you hear me?

MR. ROGERS: Oh, there you are. Okay, Bill. Yep.

MR. KLIFFEL: I do have some questions. I wouldn't be too long.

MR. ROGERS: I'm going to go off and mute.

Thanks, Bill.

MR. KLIFFEL: And, David, could you take down your document, the deposition notice. That seems to be -- having trouble seeing the full screen.

Great. Perfect.

EXAMINATION

BY MR. KLIFFEL:

Q. Dr. Krishnan, my name is Bill Kliffel. I represent the City of Flint.

Can you hear me okay?

A. I can, yes.

Q. Okay. If at any time you can't, let me know. I've tried to strike from my notes anything that's been covered, so I'll try not to cover anything twice.

Just some questions about the four bellwethers that we've been talking about that came to my mind as we've been, you know, discussing the last two days.

Can -- can a death of a close loved one in a family affect a child's performance at school or affect their behavior?

A. Are you asking that question with respect to these four children or as a general question?

Q. Generically for the moment.

A. Yes, it can.

Q. Okay. Were you aware that EPPI SPPI great grandmother, who was only 69 years of age, died in May of 2019?

A. I would have to go back to my report. I -- I'm not sure if I was aware of that or not.

Q. Okay. Would that have had any impact on your assessment of his behavior or of the condition that you diagnosed him with?

A. If you -- is it all right if I take a quick look at my report?

Q. Yes.

A. I believe -- to the best of my knowledge, that's not something I was aware of. When did you say this happened?

Q. May 22nd, 2019.

A. So this is not something that -- that came up in the discussion I had with this family. I -- I -- I have a hard time saying, you know, therefore, how much of an impact it makes. They did not really describe significant emotional changes or problems for EPPI and I did not primarily base my finding based on school problems for EPPI. I would generally not

expect a death in the family to have a significant effect on neurocognitive testing.

Q. Okay. Fine.

Now, with respect to A[redacted] T[redacted] there is a reference in her mother's deposition transcript to her being diagnosed with bipolar disorder, but my question is more generic.

Would a parent having been diagnosed with bipolar disorder impact your opinions about the conditions you diagnosed in A[redacted] T[redacted] or not?

In other words, you said ADHD among the siblings didn't impact your opinion because you didn't find that she had classic ADHD. So, what would a bipolar diagnosis in a parent do to impact your opinions, if anything?

A. So, again, bear with me a moment, please.

In A[redacted] T[redacted] case, if I remember correctly from the -- not changing any previous answers that I gave, but if I remember correctly from the discussion, there was this -- this -- there was a discussion of the family history that I understood and anxiety and that I didn't think that that was a relevant factor in the mood disorder diagnosis that I gave, but I do think that a mood disorder would

have -- there is a potential for heritability on the basis of a parental diagnosis of bipolar disorder, assuming that that diagnosis is accurate.

Q. Okay. And then could the behaviors that could be manifested in a parent as a result of having bipolar disorder, in other words, that condition in addition to being a possible heredit- -- hereditary link for the child, could that parent's behavior and the environment created by that behavior also have an impact on the development of the child from a neuropsychological standpoint?

A. I can say that that is possible. I am not able to comment on the probability of that. I did not evaluate A[redacted] mother, of course, but I was not aware in interacting with A[redacted] and her mother -- I -- I did not -- did not come across significant mood instability for the parent that would raise a concern of that kind.

Q. Okay.

A. But I do think that that is possible.

Q. Okay. I'm sorry for interrupting you.

And your interaction with the mother took place again over about an hour, hour and a half and then you had the benefit of her completing the

Vineland and the BASC-3, correct?

A. That's correct.

Q. Okay. All right. Moving now onto R[redacted] V[redacted].

I was interested to know -- in your report you mentioned that R[redacted] had actual eye or visual issues.

Do you know how back her diagnosis of visual issues went, based on your report?

A. Just a moment, please.

I -- I am not aware. If I read you the -- the sentence from my report: "R[redacted] has just been referred to see an eye doctor, so this is pending. Her pediatrician was not actually concerned, but she did fail a school test."

I -- if I understood what it -- what I was privy to, if I understood it correctly, she had relatively recently failed a school test and so the family was planning on obtaining an eye -- an optometrist or ophthalmologist evaluation, but I don't know the history of her, any visual problems.

Q. Okay.

A. I don't actually know, in fact, if she had any visual problems.

Q. Okay. Can visual problems or visual acuity problems have an impact on academic performance as a general question?

A. In general there are situations where that happens. That is part of the reason, to my understanding, that schools complete vision screens. It is really common for a child to need eyeglasses or contact lenses when they are sitting in the back of the classroom and they realize they can't read the school board and everybody else can. That is, in fact, how I started wearing glasses myself.

It would generally not be expected to have a sustained impact just because schools are doing vision screening and giving parents the feedback, as in this case the parents were planning on doing an evaluation.

Q. Okay. Can vision issues impact or affect the outcome of tests like the WISC-V or other testing that you did in R[redacted] situation, because -- and the reason I'm asking is you note that she has a visual -- she had visual issues that were manifested through your testing.

Am I correct on that, she had visual spatial issues?

A. Oh, I see. So these are visual reasoning issues. They are -- they are based on interpreting visual information, but the -- these are information processing problems. They happen in the brain and not in the eyes.

Q. Okay. So the eyes -- excuse me. The eyes cannot affect the way that you take in and then process information, if your eyes are very poor?

A. If your eyes are very poor, yes, but I didn't see any evidence that was suggestive of that when I evaluated her.

Q. Okay. Okay. Now, moving on to DPPI WPPI. Can a move of a family residence have an impact on a child's behavior in school and performance in school?

A. Yes, that is possible.

Q. Okay. Do you know that her family moved in October of 2018, which is, you know, a good portion of the way through the first semester of that year?

A. That came up in the deposition transcript that I reviewed for her family.

Q. Okay. And another thing, excuse me, wow, I'm glad we are not in the room together, I guess, today.

I also noticed in D[redacted] W[redacted] deposition transcript that I asked her about screen time and her mother told me she had two to three hours of screen time on devices during the school year and six to eight hours in the summer months.

Is screen time a significant thing in your mind as a neuropsychologist in terms of the way people act or the way that they interact with people or not?

A. So, it is a topic of -- it is a hot topic or a topic that psychologists are discussing. I'm not aware of any high quality study that a -- that associates -- that provides, like, a dose response kind of relationship between screen time and cognitive or emotional functioning. In D[redacted] case, there was a question of -- excuse me. I -- I -- I'm thinking of somebody else.

I -- I -- I would not recommend that children have that much screen time, particularly the higher number that you said, but I -- I don't recall any information that I reviewed with the family that suggested that that contributed to what I was seeing.

Q. Okay. And -- and did her parent or parents express any concern to you about the amount of screen time that she had? I didn't see that in your

report specifically, but do you remember that?

A. No, I don't, I do not remember that.

Q. Okay. All right.

I'm going to switch gears a little bit, and some of these questions are kind of basic, but I'm going to try and pare out the ones that may not be necessary, so just bear with me.

In your clinical practice when a child comes to you and there is a -- you know, a doctor/patient relationship and when you administer a complete neuropsychological examination, how long face-to-face do you spend with the child that you are -- in your clinical practice for that sort of an evaluation?

Here you said two to three hours give or take. How long does it take in your practice?

A. If -- so these -- these evaluations, aside from the -- the nature of the records review are largely similar to what I would do for a similar clinical situation. The reason I'm answering that way is I do participate in different kinds of clinics. I participate in some team care clinics where I have a relatively tight constrained amount of time. In that setting I only have about an hour and a half with each

patient, but in general what I would say is that my evaluations here are fairly comparable to what I would do in a clinical setting for children of this age. I would shoot for around three or maybe four hours of cognitive testing. I would spend about an hour to an hour and a half with the parents. And I would typically give a same-day feedback that would consist of an hour or two or so as well.

Q. Okay. Now, the battery of tests that you selected for these bellwether, these four bellwether children we are discussing, they are pretty similar, and there are a couple where you added one or took one away.

My question is in your clinical settings, are the batteries that you are using there pretty similar to these or were these varied and changed up compared to what you normally do?

A. So in general these are all tests I use in my clinical setting. And -- and so, again, if I saw a child similar to these four children, I may well give exactly the same battery, depending on the time constraints, it might be slightly longer or shorter.

The only exception I would give is, again, in some of those settings where I'm working with

children and I have a very short amount of time, I -- so we didn't discuss effort testing in great detail, but I did include effort testing in all of these evaluations. I -- I always in -- incorporate some kind of measure or validity or effort in medical/legal evaluations. I almost always do that in clinical settings, as well, unless the appointment is very short and there -- and the time is precious.

Q. Okay. Now, under the WISC-V, are there five cognitive domains?

A. That's not the reason it's a "V," but, yes, that's correct.

Q. Okay. So what does the "V" pertain to? I probably have it wrong.

A. No. No, sir. It's the fifth edition of the test.

Q. Okay. Well, no, my -- my question is how many cognitive domains are tested for under the WISC-V?

A. As it happens, the answer is also five. So, I don't want the -- I don't want to get too far in the weeds unless you really want me to.

The WISC-V is a measure of general intellect. In psychological literature that construct

is sometimes just referred to as G, and IQ is a measurement of G. G is a measure of -- it is something like a measure of overall thinking health. If you had to pick one number that characterized a person's cognitive abilities, then -- then this G or IQ is the number you would choose.

The way that -- I'm not an expert in -- in designing IQ tests, but the way that IQ tests are designed, generally speaking, is that all of the subtests administered are highly correlated with each other, meaning that the performance is very similar on one to another. The reason many subtests are administered is because by administering many corl- -- highly correlated tests you derive a more accurate estimate of IQ, intelligence quotient or this quantitative measurement of this G factor.

However, although these tests are highly correlated, if you do something that statisticians call factor analysis, then these tests that are highly correlated fall into slightly different sets of thinking skills. In the case of the WISC-V, it breaks into five skills, older versions of this test broke into a smaller number of these domains. Briefly those domains are verbal comprehension, visual and spatial

construction, fluid reasoning, working memory, and processing speed, and so those are the reasons that the subtests are listed in five rows in my score summary.

Q. Okay. Okay.

Now, can you make a comment based on a single subtest of one of the domains of the WISC-V in terms of the performance and that domain or should you do more than one subtest from that domain to make a comment on performance?

A. So, I obviously cannot speak for all neuropsychologists, but in general in my experience neuropsychologists view IQ tests as being a small subset of their arsenal. If anything, I'm usually trying to spend less time measuring IQ and more time measuring other things. The reason for that is that IQ is a measure of general cognitive health, but in general we are asked to see people because they have specific kinds of problems.

With that being said, these tests vary a little bit in duration and complexity, but as a general practice, I look for overlapping corroborating information from multiple tests, and I think that I mentioned this several times to Mr. Rogers, to his

chagrin, to some extent, but I avoid reading individual tests in isolation as a general matter of practice.

Q. What is the range of normal IQs in children?

A. That depends a little bit on how you define normal. IQs are distributed on a Gaussian, G-a-u-s-s-i-a-n, or normal or bell curve distribution, meaning that there is no sharp distinction between an IQ that is normal and abnormal. Neuropsychologists typically consider 1.3 standard deviations below the mean to be -- as a -- as a common level that is inferred to be impairment. That's -- in the IQ metric that's 80, and so using that standard 80 to 120 would be normal.

Q. Okay. Now, does IQ testing and the results for that testing, does that get more accurate as children get older or conversely is it less accurate when the children are younger?

A. That's an excellent question.

Generally speaking, IQ becomes more stable over time. IQs for young children, and by "young" I mean probably less than about six years of age, are not as effective as long-term predictors.

Q. Okay. And then if you took one child and you tested them in year one and they were let's say like eight years old and you tested them a year down the line, how much variability is there in IQ testing of the same student or the same subject across two tests?

A. That's a good question. I have to decompose that into two slightly different questions, if you -- if you'll bear with me.

So, neuropsych -- I apologize, too, the sun is shining just now and I want you to be able to see me.

Neuropsychological tests, generally many of them have susceptibility to something called practice effects. It just varies from test to test, but what a practice effect means is that if you do a test and then you take the test again, then you do better the second time than you did the first time. For reasons that I think are apparent.

In general, IQ tests have known practice effects. I don't have those statistics right in front of me, but those -- the practice effect size is on the order of a third to half of a standard deviation. And that diminishes over time, and so the further away the

less the size of that is.

But then the second question is how -- how accurate are the IQ measures to begin with and -- and so scientists if they use kind of like this artificial reality in that kind of question if I -- if I consider one of these children I imagine that I have ten clones of the same child, right, and -- and ten clones of myself and the ten of me evaluate the ten of them so that each of them only do the IQ test once. If that's not too absurd to imagine.

Then the question is, like, how similar would their IQs be, right? In a perfect world we would imagine that their IQs would be the same. Generally speaking, that range is relatively small. It's probably on the order of a third of a standard deviation, to my recollection.

Q. Okay. All right.

Switching gears just a little bit, to what extent, if any, do you believe that this COVID pandemic has impacted your ability or any -- any neuropsychologist's ability to test for IQ? Did it have any effect on the testing of these four, for instance, that you can tell us about or not?

A. So, as -- as Mr. Stern alluded to earlier

in the deposition, the time that I was retained was during the acute pandemic. Michigan was at a stay-at-home order, as you know, at that time, and there was a period of time in which neuropsychologists, most neuropsychologists were not completing evaluations at all, and, in fact, the evaluations that were done were close in time to the earliest timeframe that it was safe to do these kinds of evaluations again.

In my clinical practice, I did make adaptations to my battery to reduce the amount of paper that children came physically into contact with or other physical stimuli that the children came into contact with, but in terms of administering an IQ test, I did not observe any major barriers. We looked for things like increased close mishearing, right, and so if -- if I say blood and you think I said flood or vice versa, I'm just picking random words that sound similar to each other, that would be my cue to think maybe like this would be something that was caused, for instance, by the fact that I'm wearing a mask. And I didn't really see any significant issues in that regard. They would pop up less in the WISC and more in tests like this California Verbal Learning Test,

and I really didn't see anything that was unusual, and so I'm not sure that there have been careful scientific studies on neuropsychologists administering tests during COVID, but I don't believe that COVID had a significant impact on the test outcomes.

Q. Okay. Doctor, does the literature say what component of IQ is hereditary?

A. Generally speaking, IQ is fairly hereditary in most individuals, and so there -- there are -- you know, there is significant literature about the inheritability of IQ and it is moderate in nature.

The -- the -- typically moderate means there is still a significant amount of variance that remains for other factors.

Q. Okay. Does the literature land at -- at any level does it say 30 to 80 percent or 50 percent or anything like that that you can tell us about right now or not?

A. I would have to review the literature.

Q. Okay. All right.

The -- the article that Mr. Rogers put on that we talked about a little bit talked about some factors that can impact IQ.

Does a supportive home environment impact

IQ and IQ-related performance?

A. I think in general factors such as the level of environmental stimulation have a substantial effect on IQ.

Q. Okay.

A. The research on that has gone back and forth, but so an enriched environment is generally conducive to higher levels of IQ. The complication for psychologists in answering that question has been that traditionally enriched environments are also more often provided by high SES individuals who are high S -- socioeconomic status -- because they are also high IQ to begin with, and so the -- the nature and nurture kind of tease out is difficult in that case.

Q. Okay. So I guess a corresponding question would be: Are you suggesting that things like reading aloud with your children, playing math games, maybe watching different sorts of more educational higher quality TV, are those the sorts of things that would be a good home environment that would foster IQ or the development of IQ?

A. They generally foster the development of positive cognitive skills. I -- I am not sure how large of an effect they have on IQ, but they are

certainly -- I -- I would -- if I -- for my own child, you know, my approach would be to talk to them a lot, read to them and -- and minimize television, yes.

Q. Okay. Switching gears again a little bit, when you look at attention disorders or ADHD, I think that -- and tell me if I'm wrong, but I think the Vineland and the BASC-3 are very useful tools that you used to try to find out if there are those sorts of issues with the child.

Did I get that right or did I -- did I get that wrong?

A. No, I think you got that correct.

Q. Okay. Now, typically in your clinical practice, if you had a parent come in and you were testing a child and you did the Vineland and the -- and the BASC-3 with the parent, would there typically be a corresponding test that you might send to a teacher or an educator or a counselor at school to get a corroborating opinion that might or might not dovetail into the parents' opinions?

A. That is very helpful. By tradition the expectation for ADHD is that it presents in multiple settings. The -- in a -- in a clinical setting the biggest challenge is modern expectations for

turnaround time. I -- I -- I generally give parents feedback on the date of the evaluation. I -- the physicians as well as the parents are expecting relatively rapid turnaround and oftentimes getting teacher reports is somewhat unpredictable. What we do in the clinical setting to manage that is, one, oftentimes pediatrics before they refer children to neuropsychology has already done that, and so certainly we take that into account.

If we can't get the psychometric data, then we look at, you know, anything else that the school is able to provide, but certainly, yes, I do think that that is a good practice when it is possible.

Q. And for these four bellwethers that we are talking about, the closest you came to that, I would imagine, would have been whatever the school records divulged or the report cards.

Is that a fair statement?

A. Correct.

Q. Okay.

A. Of anything that came up. Yeah, the -- the only direct testimony from the school was the educational records that I reviewed in my reports.

Q. Now, with respect to these four bellwethers we are talking about, you don't have any IQ information on their biological parents, do you?

A. I do not, to my -- the best of my knowledge.

Q. Now, A[redacted] T[redacted], she had, I believe, a fraternal twin.

You don't have any IQ data on her fraternal twin, do you?

A. I do not.

Q. Okay. I saw that you -- you talked about the TMT a little bit earlier over the last two days.

That's quite an old test, isn't it, developed for the Army? Wasn't that developed in the 1940s?

A. I think that that's correct. There are some neuropsychological tests that go all of the way back to the -- even the 1910s or 1920s. Some of these tests began before -- before there were even measures like CTs or MRIs that would allow for visual imaging of the brain, and so some of the early history of neuropsychology was identifying brain injuries when there were no other available corroborating tools.

Q. Okay. And I think you told us that the --

the TMT has been normed and you gave us that information today, where to find that?

A. Correct.

Q. When was that normed?

A. Yeah, it is -- it is -- oh, I'm sorry.

I would have to look back in that report. It would have been within the last 20 or 30 years. Many of these tests are re-normed over time and so the norms that are being used are not norms from the 1920s or 1940s.

Q. Okay. All right.

And then you also used the Tower of London. The question I had was: You are familiar with the D-KEFS, the Dallas Kaplan Executive Function System? I think that's referenced in your summary --

A. I am, yes.

Q. You didn't -- you didn't administer that to any of these four children, did you, the D-KEFS?

A. I did not use the D-KEFS, no.

Q. Okay. Are the -- the TMT and the Tower of London, are those preferable to you than some of the subcomponents of the D-KEFS?

A. So, I -- I want to be respectful of other neuropsychologists, both Dean Dallas and -- and Edith

Kaplan are incredibly well respected in our field. Every test has pros and cons. If I talk shop a little bit, the difference tends to be between the D-KEFS and some of these other options that the D-KEFS tests tend to have many different conditions that lengthen the tests in a way that I don't find very useful. That's, for instance, with respect to the trail making test. The -- the standard trail making test has two conditions and the D-KEFS, I believe, has five.

With respect to the Tower of London versus the -- the Tower of Hanoi that is in the D-KEFS, I have -- I have used the D-KEFS extensively in my own training and -- and I use it still sometimes in my clinical practice. My experience with the D-KEFS tower is that it provides less useful information than the Tower of London. And so if I use the term "like," I -- I like or find the Tower of London Drexel Edition to be more useful than the one that's in the D-KEFS.

Q. Okay. All right.

When you are administering a test like the -- like the WISC-V, and tell me if I get this wrong, but I think what you do is you -- you are testing the child on a certain subcomponent of that test and if they get two or three wrong, do you then

stop and move on or do you prompt the child and try to get them back and see if they can complete it successfully?

How does that work? Do you do it one way or the other or is there a mixture?

A. So that -- the -- the manual for the D-KEFS standardizes both of those things, and so, without getting too deeply into the test security itself, there are standards for both of them, and so -- and I follow those and so I provide cues when there are certain situations where children provide ambiguous answers and I provide cues to determine if the -- if -- to make sure I understand how to score the answer.

All of the subtests on the D-KEFS are -- sorry -- all of the subjects on the WISC-V have discontinuation rules where -- which is the second thing that you referred to, where when a child gets items repeatedly wrong, they stop. The exception is the coding subtest does not have a discontinuation rule, but -- and I follow those rules as -- as they are published.

Q. Okay.

A. In addition to that, you know, informally

with children as a standard of care, if children are responding very quickly or impulsively, I -- I also provide more informal cues that I understand to be within the standardization of the WISC and so, for instance, if there is a series of items where a child is picking from five options and they keep picking one immediately, I'll say something like, make sure you look at all of the options before deciding.

Q. Okay. And -- and, again, for the reports for these four bellwether children, did you overtly state in your reports whether you were giving them the cues or is that just understood because it's your protocol that you would normally follow?

A. I -- I believe that it's understood, but it -- so the cues and the discontinuation rules are not my protocol. They are the -- the standardization for the WISC or -- or the test in question.

Q. Have you followed those protocols for -- for these tests across these four children?

A. I did, yes, to the best of my knowledge.

MR. KLIFFEL: All right. Doctor, I believe that those are all of my questions. So I appreciate your time and patience. Thank you.

THE WITNESS: Thank you.

MS. CARO: Are there any other defendants that have anything that they'd like to ask? Dave?

MR. ROGERS: No, I don't have any follow-up. Thanks.

MS. CARO: Okay. I just have a few follow-up questions.

EXAMINATION

BY MS. CARO:

Q. Doctor, are you aware of any literature that concludes that bone lead levels are not reliable?

A. I am not.

Q. And what is your understanding of the reliability of the bone lead level test?

A. My understanding is that they have a measurement error and if I remember correctly the bone lead levels that I was provided for these children included the measurement error and so they would say something like, this child had 1.5 micrograms per gram with a measurement error of 1.1, meaning that -- that the possibility of a zero level could be excluded.

My understanding is that the -- all of the -- all of the bone lead levels were above the measurement error in these four children.

And then, in general, I understand that

bone lead levels act as an integrator or aggregator, meaning that they provide a -- a more long-term stable level with less fluctuation than blood.

Q. Can you remind us and state on the record what the bone lead levels were for each of the four?

A. If you bear with me, yes, I would be happy to.

These are -- these are to the best of my knowledge from my review of the records that I was provided.

For E[redacted] S[redacted], I understand that there was an 8/24/19 bone lead density assessment with the result of 6.72 micrograms per gram.

For A[redacted] T[redacted], I understand that there was an 8/15/19 bone lead assessment with a result of 9.65 micrograms per gram.

For R[redacted] V[redacted], I understand that there was an 8/15/19 bone lead density of 5.58 micrograms per gram.

For D[redacted] W[redacted], I understand that there was a 2/14/20 bone lead density of 5.46 micrograms per gram.

Q. Thank you.

Were all of the bone lead level tests

consistent with the impairments you found in the testing, in your testing?

A. All of these children I read as having abnormal neuropsychological results. Those results are, I believe, within the range of the kinds of impairments that are seen in children with this level of lead exposure.

Q. And you testified that lead leaves the body through urine excretion and that you expect over time attenuation of deficits.

That's not the same as to say that there may not be permanent damage, is that correct?

A. That is correct.

Q. Or that there could be long-term negative outcomes, is that also correct?

A. That is also correct.

Q. Could you elaborate on what kinds of permanent damage may be caused by the lead levels that -- that we experienced here and some of the long-term health outcomes that -- that could occur?

A. So, within my area of expertise having to do with cognitive and emotional functioning, there is a really broad range of impairments seen, although among the more common impairments are impairments in

things like attention and executive functioning, impairments in visual and spatial skills and mood and learning problems.

Q. And are these things --

A. And so if I understand your --

Q. Go ahead. I'm sorry.

A. Sorry.

And so the -- the -- the concern is that these would generally maintain over time and continue to -- to limit the children. It's possible that they would improve, but there are also situations where they get worse in the form, not of getting worse in an overall sense, but as discussed in the reports in the case of something like nonverbal learning disorder, oftentimes that becomes evident once a child is at a certain academic level and it's not impaired -- not as apparent in testing at this age.

Q. And could that be something that's -- could those kinds of types of outcomes, can they be permanent in nature?

MR. GAMBLE: Object to form, foundation.

BY THE WITNESS:

A. Yes, they can.

MS. CARO: Okay. Thank you very much. I have

nothing further.

THE WITNESS: Thank you.

MR. KLIFFEL: Dr. Krishnan -- oh, go ahead, David.

FURTHER EXAMINATION

BY MR. ROGERS:

Q. Yeah, I do have a -- sorry. Let me start the video. I do have a couple of follow-up questions on the blood lead tests, Dr. Krishnan. And it involves the date on which the tests were conducted.

So, let me share -- so in your report you have described or identified the dates on which the bone lead tests -- bone scans were done, right?

A. Correct.

Q. Do you know where you received that information, because I'm going to share my screen with you now, and I will show you as an example the bone lead result report that we were provided for EPPI SPPI and you can see here this is the whole report, and it has a date of birth and it has the results and so forth, but it doesn't have the date it was performed.

So, where did you obtain -- do you -- do you have bone lead result reports that are different

than this or where did you obtain the information about the date on which they were done, the dates on which they were done?

A. No, I think you are correct, and I apologize if I misspoke earlier unintentionally. I believe that that was provided via separate -- that may have been provided via a separate communication, and I would be happy to -- to provide that back to the attorneys to provide to you.

Q. Well, what I'm really interested in is if -- if you wouldn't mind checking with respect to these four plaintiffs in your file materials, I think we covered this yesterday, but I just want to make sure, do you have something in addition to this concerning the bone lead testing that was done on EPPI SPPI , for example? I want to make sure that there is nothing else there related to these bone lead tests that -- that we don't have that you have.

So if you wouldn't mind, can you -- can you open up your file on SPPI and go to the section where you have the bone lead results and just see if there is anything else in there besides this document that's on the screen?

A. Again, I apologize. My memory is actually

that I was provided, now that you mention this issue, I was provided a spreadsheet by the counsel and so this requires me to amend an answer that I previously provided you.

I was provided a spreadsheet by counsel that clarified the dates of the bone lead results because I -- I asked the same question myself.

Q. Okay. But let's -- let's just be clear.

So, do you have in your file this document that's up on the screen now, the bone lead result report for EPPI SPPI

A. Well, let me look.

Yes, I do.

Q. And in addition to that, you mentioned a spreadsheet.

Is that a spreadsheet that has -- well, tell me what the information is on the spreadsheet that you received? Can you pull that up and just tell me what's on it?

A. To the best of my recollection, the spreadsheet had a list of the dates and -- and values for these bone lead results.

Q. Do you have it that you can open -- find it and -- and confirm that?

A. Would you like to take a short recess for that?

Q. Well, we could do that, yes, but with respect -- would you also at the same time check to make sure that for the other three plaintiffs, TPPI, VPPI and WPPI, in addition to the spreadsheet that you are looking for you don't have anything other than these bone lead results for those plaintiffs as well?

Do you understand my question?

A. I -- I am not sure I do. I'm sorry.

Q. Okay. So here we have a bone lead result report for EPPI SPPI and you just checked and you said that you have it in your file, right?

A. Correct.

Q. I'm asking you, if you would, please, check your file materials for the other three plaintiffs, TPPI, VPPI and WPPI, and confirm that you have the bone lead test results reports like this one that's on the screen for SPPI, for them, and also determine whether there is anything else that you have by way of records about the bone lead scans and test results for any of the plaintiffs besides the spreadsheet that you just described. Okay?

A. Okay.

Q. Okay. So yeah, you want to -- we'll take a couple of minute break. And let's just stay on the record, we might as well. I don't care how we -- how we want to do it.

A. Please give me five minutes to look for it.

Q. Yeah. So basically what I'm asking you to do is see if you can find in your files any information that you have about the bone lead results because of what we just discussed, okay.

MR. ROGERS: So let's go off the record for five minutes.

THE VIDEOGRAPHER: Going off the record, 1:09 p.m.

(WHEREUPON, a recess was had from 1:09 to 1:14 p.m.)

THE VIDEOGRAPHER: We are back on record at 1:14 p.m.

All set.

BY THE WITNESS:

A. So, thank you for the -- the time to check my records.

So you asked two questions. The first one

of the questions was whether there were any other documents in my full records for the -- the children, these four children that I didn't already mention to you. I read those documents directly from my folders and there are not.

However, there was a document that was provided to me by Levy Konigsberg that I didn't put in my records because it was not about one child but about all of their clients, and so I apologize for not mentioning that earlier. The document contains the bone lead testing dates and I have forwarded that back to them and they will -- they will be making sure that there is nothing that they need to redact that isn't relevant and -- and sending that to you.

MR. ROGERS: Okay. Thanks a lot. That's all I have.

MS. CARO: Okay. I have nothing further.

THE VIDEOGRAPHER: One moment.

This ends today's deposition. We are going off the record at 1:16 p.m.

Thereupon, at 1:16 p.m., on Tuesday, October 6, 2020, the deposition was concluded.

REPORTER'S CERTIFICATE

I, JULIANA F. ZAJICEK, a Registered Professional Reporter and Certified Shorthand Reporter, do hereby certify that prior to the commencement of the examination of the witness herein, the witness was duly remotely sworn by me to testify to the truth, the whole truth and nothing but the truth.

I DO FURTHER CERTIFY that the foregoing is a verbatim transcript of the testimony as taken stenographically by me at the time, place and on the date hereinbefore set forth, to the best of my availability.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not interested directly or indirectly in the outcome of this action.

IN WITNESS WHEREOF, I do hereunto set my hand on this 22nd day of October, 2020.

Juliana F. Zajicek

JULIANA F. ZAJICEK, Certified Reporter

DEPOSITION ERRATA SHEET

Case Caption: Flint Water Cases

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

MIRA KRISHNAN, Ph.D.

SUBSCRIBED AND SWORN TO
before me this day
of , A.D. 20__.

Notary Public

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MIRA KRISHNAN, Ph.D.